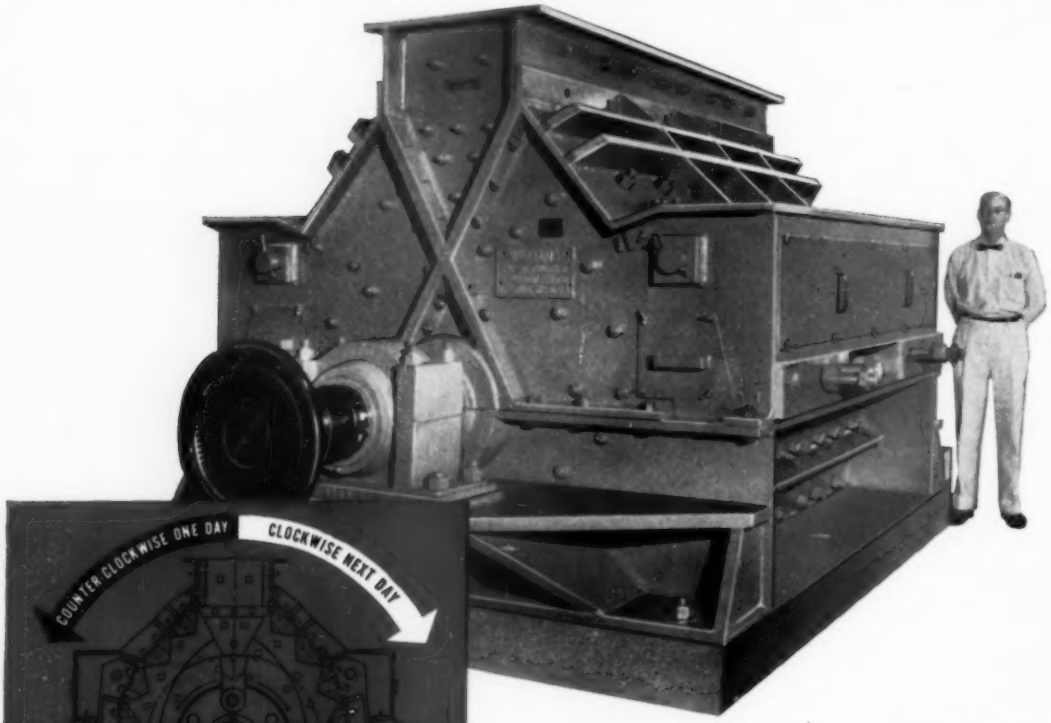
JULY · 1960

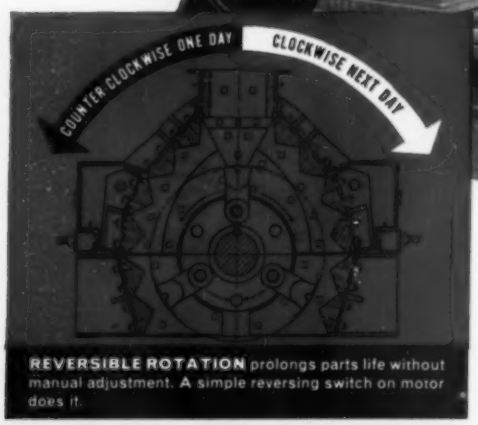
# ROCK PRODUCTS

**New sand plant strives for market supremacy,**
page 90

**They stood their ground in Louisville,**
page 82

# More efficient CRUSHING AT LOWEST COST for labor, power and upkeep with WILLIAMS REVERSIBLE IMPACTOR






**REVERSIBLE ROTATION** prolongs parts life without manual adjustment. A simple reversing switch on motor does it.

**INTERIOR VIEW** of small Impactor shows typical rugged hammers, impact blocks and liners made of manganese steel and other alloys. Rotor removable without disturbing feed or other mechanisms.

For secondary crushing, the economy and high production of a Williams Reversible Impactor is unequalled, whether raw material is hard and abrasive or soft and friable. Precision control of specified top-size is easy, usually in a closed circuit system, from a coarse 2" with minimum fines, down to 35 mesh or finer.

The Impactor has no grates. Material fed into the mill is reduced to proper size while rebounding between the whirling hammers and impact blocks, until discharged from bottom opening. Grinding or rubbing action is eliminated—power, replacement parts and downtime are reduced to a minimum. No fine adjustments need be maintained.

*Reversible rotation* is a prime feature of the Williams. So is *Wide Open Accessibility* to interior. So are the *Interchangeable Impact Blocks* to balance wear. So are the many other exclusives that hold cost-per-ton to the very lowest. There is a size and model for your exact needs. *Write for catalog.*

**WILLIAMS PATENT CRUSHER AND PULVERIZER CO.**
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Hammer Mills · Helix-Seal Mills · Roller Mills · Air Separators · Vibrating Screens · Feeders

**WILLIAMS**
CRUSHERS · GRINDERS · SHREDDERS

*Oldest and largest manufacturers of hammer mills in the world*

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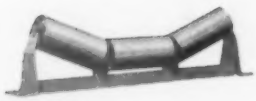


**SERIES 5000**
For intermittent operation . . . relatively low capacity.

**SERIES 6000**
For continuous operation . . . moderate capacity.

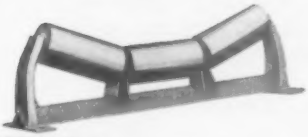
# 759 ways to solve your idler problems

*Link-Belt idlers in standard types and sizes to meet every conceivable belt conveyor need*

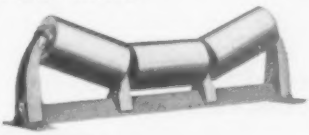
You're sure to find the exact idler to perfectly match your belt conveyor requirements from the complete Link-Belt line of 759 types and sizes.

This broad line enables you to select a size idler that exactly matches your needs, no over- or under-engineering. Power requirements are held to a minimum. In addition, anti-friction bearings, accurate roll alignment and rugged construction provide maximum life for idlers and conveyor belt in light- or heavy-duty service.

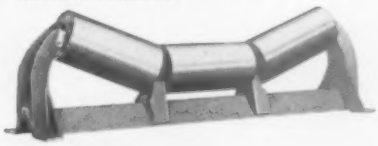
Link-Belt idlers are available with end rolls inclined at 20°, 35° and 45° for a broad range of belt widths. Matching lines of troughed belt rubber cushion, troughed belt training, return belt and rubber tread return belt idlers are also available. Call your nearest Link-Belt office or authorized stock-carrying distributor for full details. Look for CONVEYORS in the yellow pages of your phone book. Or write for Book 2716.



**SERIES 7000**
For continuous operation, higher capacities, heavyweight, abrasive materials.



**SERIES 8000**
For continuous operation, higher capacities, heavier-weight, abrasive materials.



**SERIES 9000**
For continuous service, highest capacities, heaviest and coarsest materials.

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**BELT CONVEYOR IDLERS**

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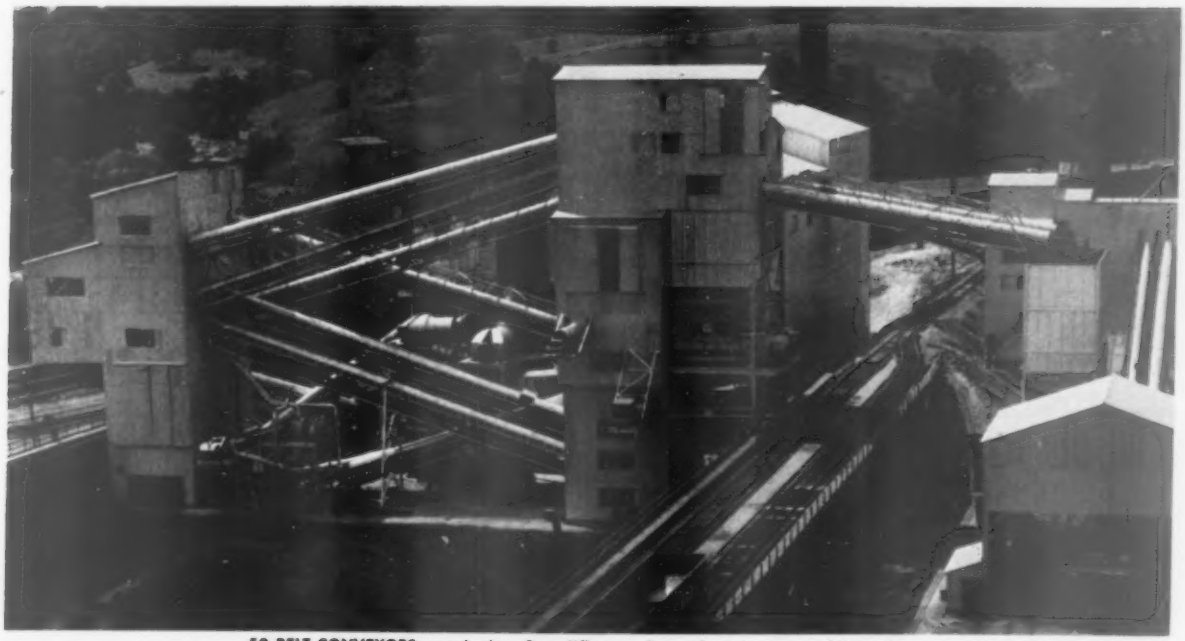

**50 BELT CONVEYORS,** employing five different sizes of various type idlers, keep raw materials moving steadily through this sintering plant of Armco Steel.

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# ROCK PRODUCTS

a Maclean-Hunter publication, Vol. 63, No. 7



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July 1960

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# Rubber takes pounding that wears holes in steel

YOU quarry men can sympathize with this impact problem at a Michigan iron ore mine. Big chunks of ore—some weighing up to 2 tons—crash down from that vibrating feeder to a wear pad below. This terrific pounding 8 hours a day, 5 days a week, quickly wore holes in a ½" thick steel plate, caused frequent shutdowns for repairs and replacement.

To avoid these costly delays, a B.F.Goodrich distributor suggested a wear pad made of a rubber called Armorite, specially compounded to stand this sort of a beating. This rubber is soft enough to *give* under the pounding it gets, yet so tough that it is even used in some places to carry broken glass.

The Armorite wear pad stood up under the pounding for 14 months—six times longer than the steel plate. And the Armorite pictured at left, which replaced the first when it finally wore out, is expected to last even longer because of a different method of installation.

B.F.Goodrich Armorite can be used in dozens of ways—as a liner, curtain, throw mat for protection against abrasives. Can be ordered with or without a reinforcing back of fabric, fiber or steel. Your B.F.Goodrich distributor has full information on Armorite. And, as a factory-trained specialist in rubber parts, he can answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-865, Akron 18, Ohio.*

**B.F.Goodrich**

**CHUTE LINING**

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*Needed: 190 tons of 3/4" minus aggregate per hour*

# New Diamond Plant Gets Job

Another feature that impressed Frank Strausberg is the portability of the new Diamond model 70 rotor-lift crushing plant. It is equally at home on the road or in the pit.

When Frank Strausberg & Son, Saginaw, Michigan contracting firm, was awarded a contract for aggregate for asphalt surfacing and shoulders on State Route 57, it needed a crushing plant that had plenty of capacity and portability. Diamond Iron Works sales engineers were called in and asked for their recommendations.

Based on a thorough and convincing analysis of the problem, Strausberg purchased the *new* Diamond model 70 rotor-lift crushing plant. Here are the results. Currently, it is producing 3/4" minus aggregate for asphalt surfacing at the rate of 190 tons per hour. All material is pit run requiring 48% crush and subject to state check four times a day. The plant is moved about every three days in the pit, or to other pits. It has more than lived up to expectations for high capacity and portability. Also, of particular importance has been the smooth performance plus an unusually low horsepower requirement.

**Other Features of the New 70**

- **10" x 36" roller bearing jaw crusher**
- **32" x 24" star gear roll crusher—a large crushing area for more crushing per revolution of rolls**
- **4' x 12' 2 ½-deck screen that provides more than adequate screening area**
- **30" conveyor belts throughout (5-ply, 28 oz.)**

High output, portability and economy of operation . . . that's what the new 70 has done for Frank Strausberg & Son . . . that's what it can do for you. See your DIAMOND distributor for the full story.

**Diamond makes everything for the aggregate producer:**

**Jaw Crushers • Roll Crushers • Conveyors • Screens and Washers • Feeders and Bins • Portable and Stationary Crushing Plants for Rock and Gravel.**

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DIVISION
**GOODMAN MANUFACTURING COMPANY**
*Halsted Street and 48th Place • Chicago 9, Illinois*

DIAMOND

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# WHERE A REAL ROCK SHOVEL Pays Out!

HERE'S another of the many Northwests that have gone into quarries below the Mason-Dixon Line. Here's a Northwest Model 6 getting sizable yardage for the Wilson County Rock Products Company at Lebanon, Tennessee.

A *real* Rock Shovel pays out on jobs like this. Shovel output is not measured by the speed of a hoist rope or the number of swings per minute! Production is the result of steady month-in, month-out operation. Northwests get the job done—not for the day—but for the week—the month—year-in and year-out.

Northwest design—rugged Cast Alloy Steel Machinery Bases and Machinery Side Frames that eliminate constant rebuilding; Uniform Pressure Swing Clutches, cool-running, jerk-free; the Feather-Touch Clutch Control with its *true* feel of the load; power plants are properly engineered for high altitude conditions, a Crowd that brings extra digging force to handling rock and many other Northwest advantages combine to give smoother control, greater digging power and longer, trouble-free service.

Your Northwest is always ready to go. If you are considering adding to your equipment it will pay you to bring yourself up-to-date on Northwest's latest advantages.

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# NORTHWEST

Always Ready to GO

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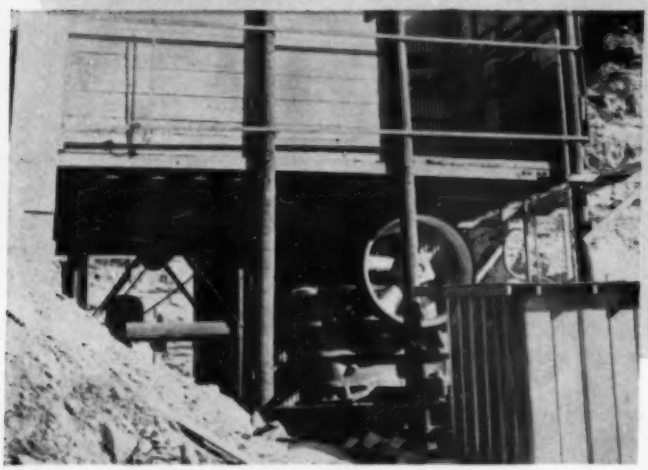
|---|---|---|---|---|
| ¾ Yd. to 2½ Yd. Capacity | 13-Ton to 60-Ton Capacity | ¾ Yd. to 3 Yd. Capacity | ¾ Yd. to 2½ Yd. Capacity | 25-Ton to 35-Ton Capacity |

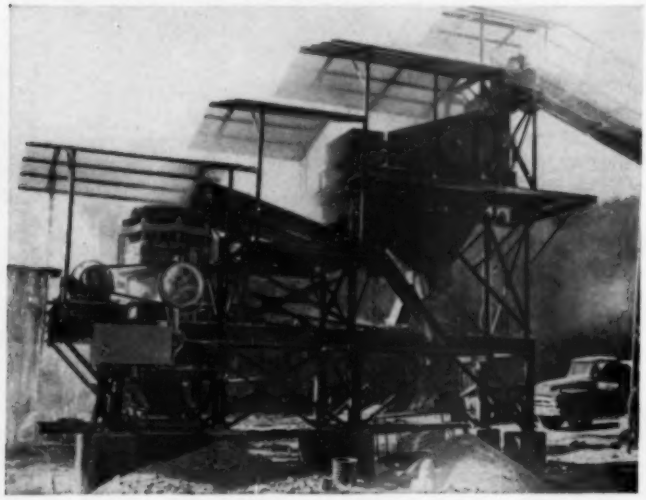
Q-40-560

***Georgia Marble Co. crushing plant***



(Above) Telsmith Jaw Crusher and Apron Feeder.

(Below) Gyrasphere Secondary Crusher and Vibro-King Screens.



# TELSMITH *designed*

## *to produce road rock and roofing chips*

Making 125 tons per hour of 1½″ plus ¼″, and minus ¼″ aggregate for road rock . . . or crushing everything down to minus ⅜″ plus ¼″, minus ¼″ plus ⅛″, and minus ⅛″ when producing roofing chips, at 75 tons per hour. That's what Georgia Marble Company's Whiteside, Ga. crushing-screening plant was Telsmith-designed to do. Does it smoothly and steadily day-in-day-out. Tailor-made for today's conditions and competition, Telsmith plants pay off in capacity, product flexibility and operating economy. Send for descriptive bulletins.

## TELSMITH Equipment in this plant—

36″ x 8′ Heavy Duty Apron Feeder • 25 x 36 Roller Bearing Jaw Crusher • 4′ x 10′ double deck Vibro-King Screen • 36-S Gyrasphere Secondary Crusher • 5′ x 16′ triple deck Vibro-King Screen • Three 15″ x 15″ Duplex Bin Gates • Five Telsmith-Barber-Greene Conveyors: 18″, 24″, 36″, total length, 312′.

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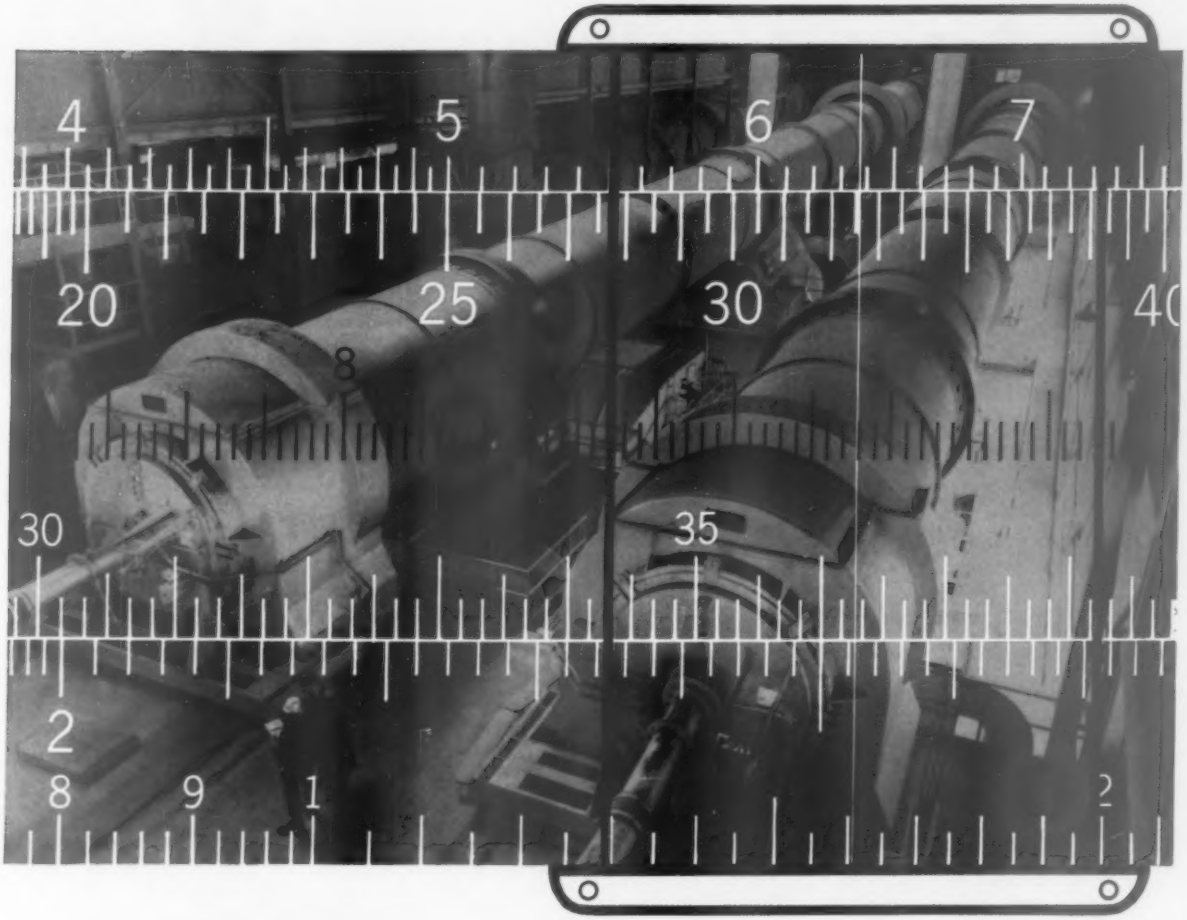
# TRAYLOR PRECISION

**from design through installation to operation**



Shown above are two* 11′-3″ x 300′ dry process Traylor kilns designed to meet the specific needs of the Lone Star Cement Plant in Nazareth, Pennsylvania. These modern rotary kilns feature full-floating type roller ring and roller supports which insure easy alignment, continuous operation and low maintenance costs. Traylor rotary kilns have all welded steel shells, feed and discharge end seals and improved kiln feed.

Write today outlining your kiln requirements and let our engineers make recommendations . . . or write for Bulletin No. 1115.

*Shown in the background are two additional Traylor Kilns, 11′-3″ x 270′.

TKA-7

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**DIVISION OF FULLER COMPANY**
1557 MILL ST., ALLENTOWN, PA.
Sales Offices: New York, Chicago, San Francisco
Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P. Q.

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## Rotary Kilns With Integral Slurry Preheater...

## Reduce Dust..

## Save Fuel

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# WHAT'S HAPPENING

## IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

**The upward seasonal trend in construction was noted in April.** New construction put in place rose to $4 billion from $3.7 billion in March. This was broken down into new private construction, rising $200 million to total $2.9 billion; and public construction, rising $100 million to $1.1 billion. All totals, said the Departments of Commerce and Labor, were below the levels of a year earlier.

**The USSR requires 60 percent more people to produce minerals** equal to about 60 percent of our mineral output, by value. This was the appraisal of Alexander Gakner of the Bureau of Mines, speaking before a meeting of AIME. He charged low productivity by the Soviets to use of low-grade resources, mining in areas accessible only with great difficulty, obsolete equipment, lack of new equipment and inadequate transportation. Where is Soviet strength? Mr. Gakner thinks it may be in determination to overcome these problems and maintain unity of purpose. Particularly advanced work is being done in chemical, optical and X-ray mineralogy, geology of ore deposits, petrology, ore genesis, geochemistry and geologic mapping, according to Mr. Gakner.

**A new asbestos mining and milling business may be in the making.** So reports W. B. Millar, consulting geologist, in Asbestos magazine. "Mountain leather"—chrysotile asbestos compacted by great heat and pressure and probably active hot solutions—is present in large tonnages in the Diablo Range of California, notably in deposits owned by Union Carbide Corp. and Basic Resources, Inc. The writer sees a market for the closely sized, dust-free, tough asbestos product as filler in plastic and asphalt floor tiles, and says that the ore can be taken out by power shovels in cheap open-pit mining. Once berated for fouling up milling circuits, these leather-like bits have become a useful industrial mineral.

**Build a bridge to link England and France.** That is the latest advice from engineers in a discussion that has gone on for years. Cost of the 21-mile-long bridge, that would have to be high enough to permit ships to pass beneath it, would be about $560 million. That is double the cost of the often-proposed tunnel, but maintenance would be lower and traffic volume greater.

**Minerals in foodstuffs, yes. But vermiculite? Maybe,** if the versatile rock product tests out well as a food supplement. It actually was a cookie ingredient in tests on animals at Illinois Institute of Technology; the researchers emphasize that it is not yet ready for human consumption. IIT scientists think vermiculite may be useful in battling overweight and in elimination of radioactive substances from the body.

**Electrical drainage can dewater and stabilize problem soils** that refuse to be dewatered by ordinary means. Soil Research Lab scientists at Iowa State University have been conducting research on the process, called electro-osmosis. In doing so, they are continuing observations that began in 1807 and were put to practical use in Germany in the 1930's. Since then there have been several applications in this country of the principle, in which water molecules become attached to positively charged ions and flow freely toward a cathode upon application of direct current voltage. The cathode, in this instance, is a negatively charged well point. Not only will electro-osmotic drainage work, say the ISU scientists; sometimes it is highly practicable and "the thing to do."

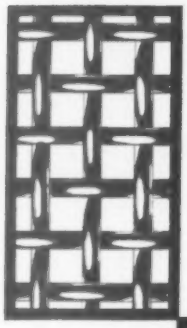
**Burned lime speeds chemical and thermal reactions in a steel-making process** developed by Ford Motor Co. In a revision of the conventional open-hearth method, Ford experimenters have more than doubled hourly output of steel. They use oxygen lances which, by pumping in oxygen, raise temperatures within the furnaces. But they have made significant additions: mixing natural gas with the oxygen in the lances, and substitution of burned lime for limestone. They can add molten iron to the furnaces only 30 minutes after the start of the charging process, instead of 2 hours later.

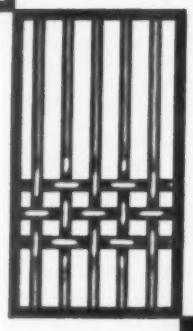
**Gypsum-treated soils do not expand.** Cornell University scientists who are working on prevention of winter's ravages to farms and highways see gypsum as a most promising measure. Unlike most salts, it does not dissolve and will stay in soils season after season. Soils treated with gypsum and placed in a freezer show little or no expansion, while untreated soils in similar conditions expand more than 10 times their original size. Prof. Robert Miller says, however, that farmers using gypsum-containing fertilizers will not be sufficiently protected against soil heaving. They do not contain enough gypsum.

**A charging aggregate for ammonium nitrate blasting** in underground mines has been reported in Sweden. Called Blu-Rox, the charging aggregate has solved difficulties of charging the drilling holes with the ammonium nitrate-mineral oil mixture. Besides being able to mix the ingredients in the right proportions, it can be rapidly charged into holes drilled at any angle, including straight upwards. Two-in. boreholes are charged at a rate of 50 to 65 fpm.

**A roadbuilding use has been found for asbestos waste products.** The Siberian Road Transport Institute has conducted research showing them to be effective and economical ingredients of bituminous and concrete mixes for surfacing all classes of roads. So far, 200,000 sq. mi. of roads using these wastes in bituminous surfacing have been built. Increasing supplies of waste products will be forthcoming as Russia's asbestos resources are developed.

**The dimension stone industry has an eye on a new market—bowling alleys.** The Barre Granite Association, testing an outdoor bowling alley of granite, is gratified with results. After three seasons, it shows no wear and has withstood temperatures from 40 below zero to 95 above.





fewer
replacements...

less
downtime...

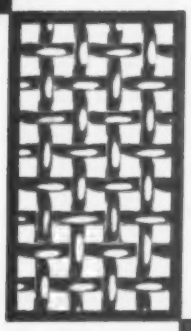
higher
output

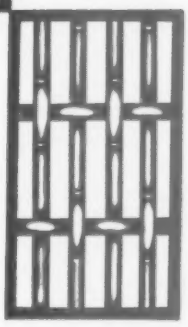
# LUDLOW-SAYLOR
## WOVEN WIRE SCREENS

Specially alloyed super-hard and ductile wire . . . tightly, rigidly woven into screens of ultimate precision. Each is machine leveled for permanent flatness . . . wire ends are sheared, not burnt off, to make screens square and true . . . then hook strips are applied with absolute accuracy.

These are but a few reasons L-S Screens have astonishing resistance to wear, breakage, distortion . . . reduce downtime and labor . . . cut the cost of replacements . . . increase production, product uniformity and quality.

L-S Screens are priced no higher than others but are worth much more. Get the best—order L-S. *Write for NEW catalog just off the press.*





Ludlow-Saylor Screens and Wire Cloth can be furnished in any steel including SUPERLOY high carbon, LUDLOW oil-tempered, stainless or other alloys; Monel, bronze, copper, brass and most other metals that can be drawn into wire.

**IMMEDIATE SHIPMENT**—*Most weaves and sizes*

*FOUNDED 1856*

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# NOTES FROM THE PUBLISHER

July, 1960

Dear Reader:

Measure the growth of the industry, and you have the measure of the men behind it.

Each year has its own built-in problems—its own abnormalities—so that any annual comparison in our national economy must take into consideration the factors that make each year's growth different from the last.

For sixty-four years ROCK PRODUCTS has participated in the difficulties that its producer-readers and advertisers alike have met and conquered in the rock products industries...depressions, recessions, wars and building booms.

The phenomonal growth our industries have enjoyed is due to the combined efforts of producers and equipment manufacturers to meet the demands of a constantly rising economy brought about by half-a-dozen factors with which we are all familiar. The industry as a whole can boast a 4-percent annual growth rate over the last decade.

Manufacturers are gearing themselves to pour millions of dollars into research and development of new products, new systems, new processes. And millions will go into improvement programs to meet today's standards. Specifications, tougher to meet today than they were ten years ago, will grow more exacting during the next few years.

One of the surest ways to keep yourself informed, up-to-date with current and future trends in your vital industry, is to read and absorb the editorial and advertising messages that come to you each month in ROCK PRODUCTS. You'll gain new insight into your own business, and you can find help when you need it.

Sincerely yours,

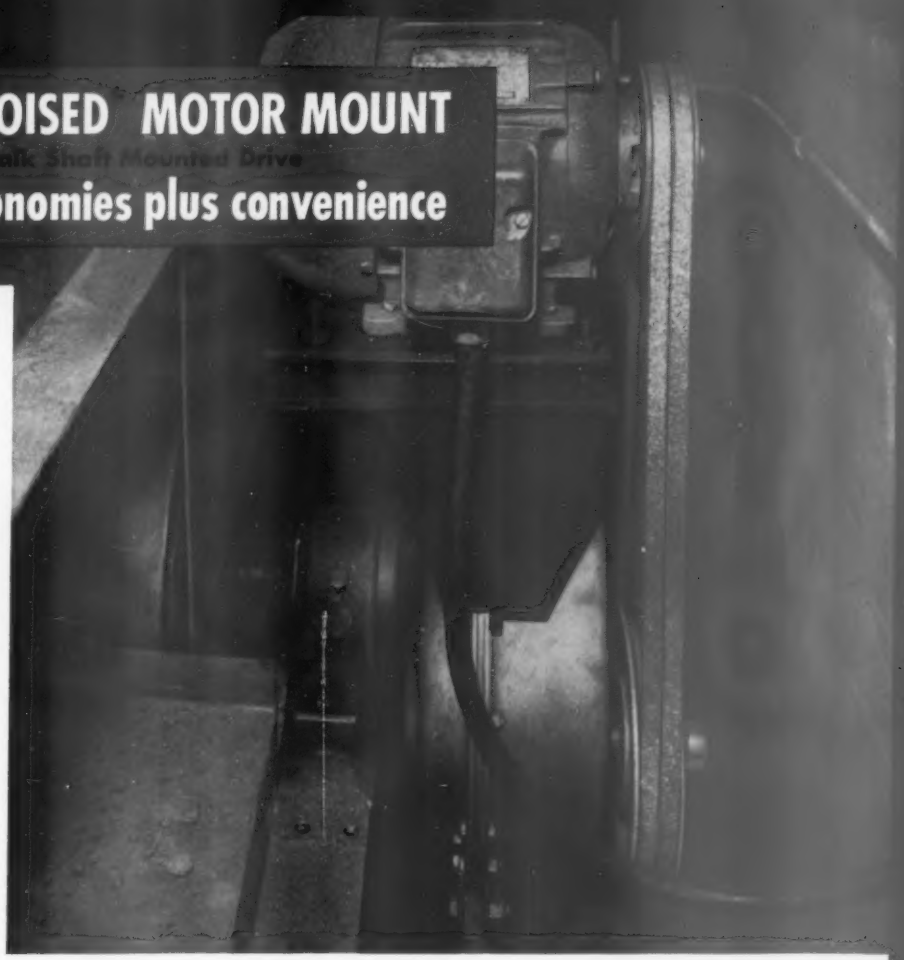
Philip D. Allen

Philip D. Allen
Publisher

# NEW FALK EQUI-POISED MOTOR MOUNT

for use with the Falk Shaft Mounted Drive

## gives unequaled economies plus convenience

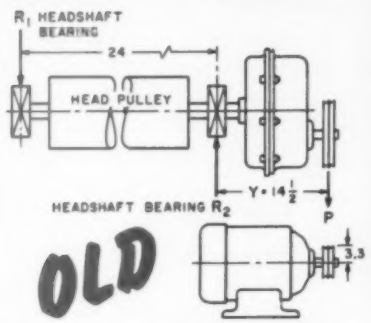


### HOW A FALK EQUI-POISED MOTOR MOUNT REDUCES BEARING LOADS ON A DRIVEN MACHINE

**GIVEN:** Motor—15 hp, 1750 rpm, Frame 284U, Weight—320 lb.
Sheave diameters—6.6/9.4
Driven machine—belt conveyor with 24" center distance between headshaft bearings.

**NOTE:** Weights of 307J24 Shaft Mounted Drive, sheaves, and V-belts are eliminated from calculations because they remain constant; do not affect the comparison.

### WITHOUT FALK MOTOR MOUNT




Torque at motor shaft = $\frac{63{,}025 \times 15 \text{ hp}}{1750 \text{ rpm}}$ = 540 lb-in.

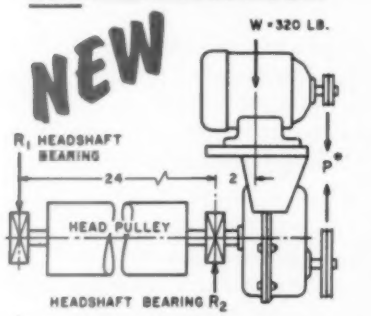
Belt pull (P) = $\frac{540 \text{ lb-in.} \times 1.5 \text{ Load Connection Factor}}{3.3"}$ = 246 lb

$R_2 = \frac{246 \text{ lb} \times (24" + 14.5")}{24"}$ = 395 lb

$R_1 = \frac{246 \text{ lb} \times 14.5"}{24"}$ = 149 lb

(Check: 395 lb—149 lb=246 lb)

### WITH FALK MOTOR MOUNT




*P = ZERO REACTION AT HEADSHAFT BEARINGS

V-belt pull has zero reaction on headshaft bearings. Therefore—

$R_2 = \frac{320 \text{ lb} \times (24" + 2")}{24"}$ = 347 lb

$R_1 = \frac{320 \text{ lb} \times 2"}{24"}$ = 27 lb

(Check: 347 lb—27 lb=320 lb)

## Falk's new EQUI-POISED* Motor Mount is a rigid, all-steel weldment, pre-drilled for bolting standard NEMA foot-mounted motor (1/2 to 30 hp) directly to the steel frame of Falk Shaft Mounted, Flange Mounted and Screw Conveyor Drives. With it, motor can be mounted in almost any position around perimeter of reducer.

(*Balancing of forces.)

### Substantial Savings for You

It saves engineering time required to design special motor bases and foundations...saves cost of labor and materials required to build special motor foundations...and saves on equipment costs by using a quality stock component. Further, its quick installation and easy maintenance mean added cost savings. The Motor Mount is a space saver, too. Where restricted space is a factor, ability to mount motor in any of several positions is an important convenience...For information on range of sizes, dimensions, etc., contact your Falk Representative or Distributor—or write direct for Bulletin 7100.

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*MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS*

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a good name in industry

**Representatives and Distributors in most principal cities**

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# EDITORIAL

by GEORGE C. LINDSAY

## What price progress?

FIRST GLANCE AT STATISTICS shows that the aggregates industries made more than usual progress from 1954 to 1958. But a deeper analysis of preliminary Census Bureau data tells a different story. The cost of operating rose faster during the period than did value of shipments. Data on sand and gravel and crushed stone industries were combined to show this result.

Not all necessary data for a complete story on costs were given in the Preliminary General Statistics publication M1(P)-1. It was issued by the Bureau of Census to cover the mineral industries for the 1954-1958 period. Yet, enough information is shown to make certain relevant comparisons.

Value of shipments of the two aggregates industries rose at an average healthy rate of 7 percent per year. This rate is nearly double the average rate of growth these industries showed for the past 20 years. Crushed stone led in the advance with an average 10-percent annual increase. It was 4.6 percent for sand and gravel. All rates are above that for all industry during the period. This would indicate excellent progress.

Look, though, at some of the cost categories, and economic progress is less evident. The money spent in three cost areas to get the high rate in value of product shipped—payroll, supplies and capital investment—rose at a higher annual rate than did value. Based on these data only, it appears that the industries were economically unstable during the 4-yr. period. Much of this may be due to the fact that 1958 was not an excellent year.

Here's what the report shows on expenditures. Total payroll for both industries rose 4.6 percent per year during the period. Money spent for supplies soared 10.9 percent per year. Capital investment jumped 8.9 percent per year. These are average annual figures.

There are other comparative data that may cause some industrial eyebrows to be raised. Value of shipments for the sand and gravel industry rose at exactly the same average annual rate as did the combined expenditures for payroll, supplies and capital investment. It was different for crushed stone. Product value for that industry increased 10 percent a year—but expenditures rose 11.3 percent.

Another interesting statistic deals with ratio of production workers to non-production workers. For the 4-yr. period, the sand-and-gravel ratio increased 14 percent. This means there was a rise in number of production workers per non-production worker employed. But the crushed-stone ratio shows a decrease of 16 percent for the period. An analysis of these movements in opposite directions would be interesting.

Surely, the industries are progressing. But a 4-yr. experience shows that greater control of costs is needed to place the industries on a better footing.



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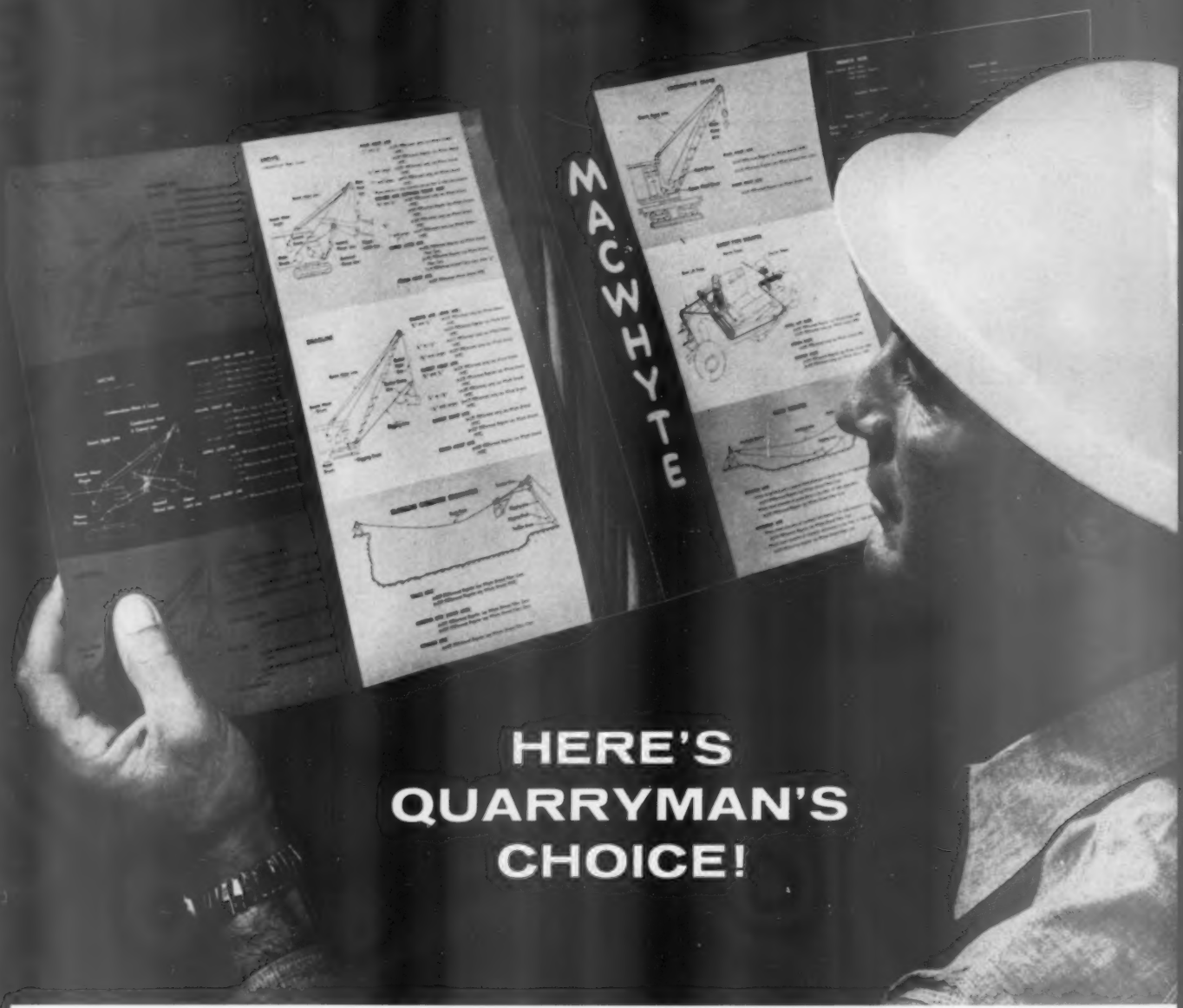


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# ROCKY'S NOTES

by NATHAN C. ROCKWOOD

## Real progress in silica, silicon chemistry

OME READERS may question ROCK PRODUCTS' interest in silicones—now more nearly related the field of organic chemistry than to any of rs. We reviewed one book on the subject about e years ago, and here we are going to discuss new one: Silicones,* by Robert N. Meals and ederick M. Lewis, both of the Silicone Products epartment of the General Electric Co. The pres- t book contains ample evidence of tremendous ogress made in those past five years in the anufacture and uses of a product that was little ore than a curiosity only 20 years ago. We be- ve our interest in the subject deserves to be ared by many of the readers of ROCK PRODUCTS r several reasons.

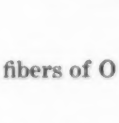
The major interest of some, of course, is because ey produce one of the principal raw materials: nd, silica or silicon dioxide ($SiO_2$). The tonnage present produced for manufacture of silicones of small significance compared with that, say, r the manufacture of glass. Yet, what is going to p expansion of an industry that already pro- ces and has found markets for over 200 varieties its product? No wonder those in the know wax thusiastic at the prospects. Our authors say in eir introduction: "For the size of the industry, product scope is amazing. Furthermore, most the present products have been based on a few lecular 'building blocks.' Only recently have ad- ional building blocks become available; the oducts we expect to result from these will great- increase the range of properties available in the icone products of the future."

The text is written primarily to describe the esent varieties of silicones, their properties and eir present and possible uses. It is not too tech- al because it is intended for non-experts. The thors explain their purpose as follows: "In writ- a new book on silicones, we still have no hope of reaching our friend behind the counter. However, the technology of silicones is developing rapidly, and engineers need to have it summarized occasionally. We have attempted to make this a readable book on applications of silicones, and only enough technical background has been included to make the book self-contained."

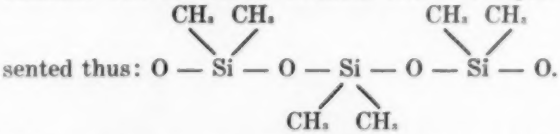
Producers in the rock products industries are hardly expected to seek out new ways to use silicones, although that is in the range of possibilities. Probably, all are using silicone products today, or silicone-treated products, under various trade names. They could well profit from reading this book. They could learn whether the grease, rubber, water repellent, etc., that they are buying is the best suited to their intended purposes.

The chapter headings are general, but give a fair idea of the scope of the book. They are: General properties; basic chemistry; manufacture and fabrication, application of silicones; future prospects of silicones, and appendix on organosilicon compounds.

The original silicones consisted of strings or fibers of



in which every other oxygen (O) ion was replaced by negatively charged $CH_3$ radicals. The structural formula could be represented thus:



This is the foundation of many silicone liquids, and their properties such as viscosity depend largely on the number of cross-linkages between the Si ions and non-replaced O ions.

Such liquids, diluted with water or other chem-

*Please turn to page 134*

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YOU'LL "REALLY

# GO" WITH THE "BIG THREE"

## 5,300-lb carry capacity... 1 to 3-cu-yd buckets

TL 14

*For all-out savings*, the TL-14 with *Tractomatic* transmission is the machine for you. On short-haul loading or stockpiling your operator selects the best working gear. By flipping a lever on the steering column, he goes forward or reverse without shifting gears. *For all-out production* on long hauls or scattered jobs, the TL-14 with full-power shift transmission fits the bill. Operators move from any one speed to any other . . . forward or reverse . . . on the go.

## 7,000-lb carry capacity... 1½ to 4-cu-yd buckets

TL 16

The TL-16 is big enough for real production work . . . yet compact enough for hit-and-run assignments. It features the same design, construction and operating advantages found in the bigger TL-20. This unit handles the same kind of work as the TL-20, but on smaller scale operations. On all jobs, you can count on the "16" for fast, efficient service day in, day out.

## 9,000-lb carry capacity... 2¼ to 5-cu-yd buckets

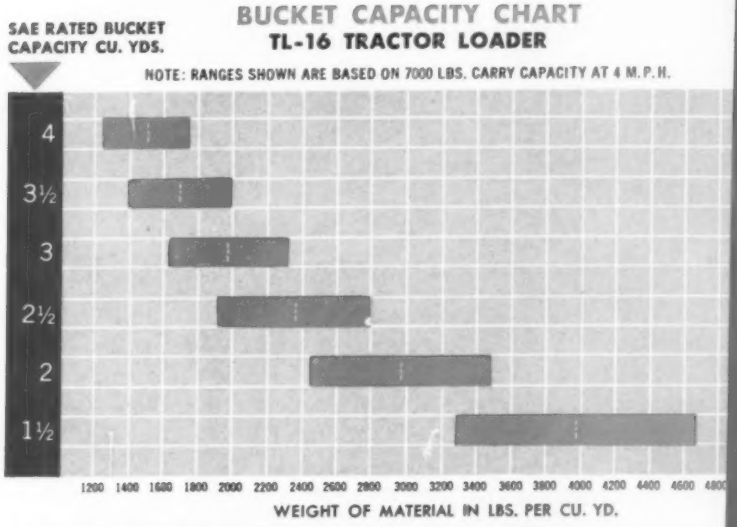
TL 20

The 130-hp TL-20 is built for big, tough excavating and loading on construction, mining, quarrying or public works projects. Its many bonus features let you get more work done . . . easier. For example, the extra reach you get lets the TL-20 load big trucks faster and higher than other machines of comparable size.

# YOU choose the bucket best suited to your needs...

Allis-Chalmers offers 18 buckets for these 3 models. The TL-14, TL-16 and TL-20 all provide 6 different bucket choices. You pick the best bucket size according to the *carrying capacity of the loader*, the *weight of material you handle*, and the *working conditions in which you operate*. Your Allis-Chalmers dealer will help you select the best profit-making tractor-bucket combination.

This TL-16 bucket chart shows how bucket sizes can be determined:


SAE RATED BUCKET CAPACITY CU. YDS.
BUCKET CAPACITY CHART
TL-16 TRACTOR LOADER
NOTE: RANGES SHOWN ARE BASED ON 7000 LBS. CARRY CAPACITY AT 4 M.P.H.
4
3½
3
2½
2
1½
1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600 3800 4000 4200 4400 4600 4800
WEIGHT OF MATERIAL IN LBS. PER CU. YD.

TO SELECT CORRECT BUCKET CAPACITY FOR ANY OPERATION YOU MUST KNOW; 1, THE WEIGHT OF MATERIALS TO BE HANDLED AND 2, THE CONDITION OF THE OPERATING SURFACES.

Your Allis-Chalmers dealer will put a tractor loader through its paces on your job. Take a good look at all of the features that make these loaders the best buys on the market. Let him set up a demonstration now. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

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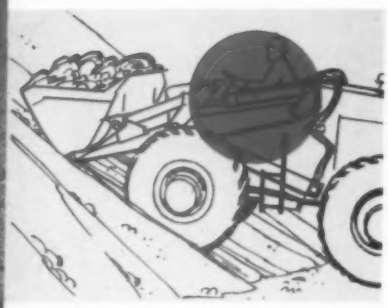
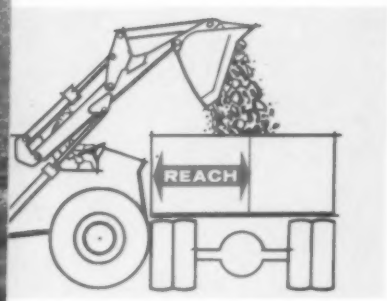
# ONLY THE TL 14 TL 16 TL 20

## safe dump cylinder location



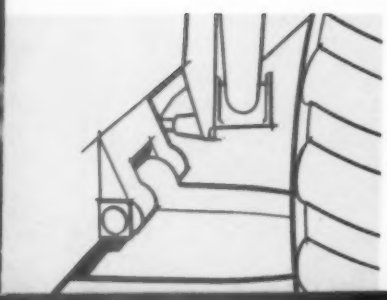
One "common sense" advantage that pays off is the safe dump cylinder location. The TL-14, 16 and 20 have cylinders located up and away from abrasives . . . out of grit that scores piston rods and damages hydraulic components. By mounting cylinders away from the bucket Allis-Chalmers loaders lift more pay load . . . less dead weight.

## extra lift and reach




The "Big Three" give you more *usable dumping height and forward reach* than units of comparable size. Because Allis-Chalmers measures loader reach from tires, you are assured of *effective reach* . . . reach that pays off when loading high-body trucks. The TL-20, for example, gives you a foot or two of *extra reach* for faster loading with less chance of damage to truck or loader.

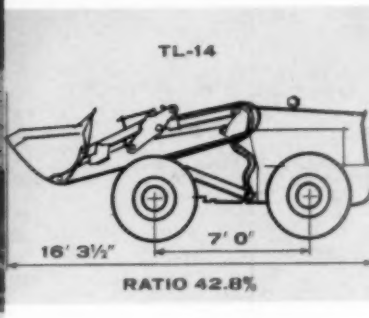
## pin-connected axles



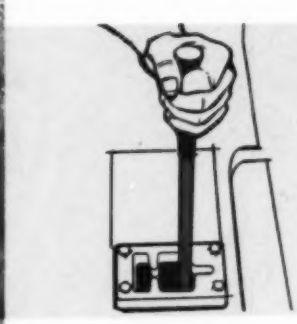
Axles on Allis-Chalmers "Big Three" loaders are pin-connected directly to the frame with 2-inch diameter steel pins . . . not automotive-type, U-bolt connections. In rough going, these units stay solid . . . axles do not roll or shift under load.

# OFFER ALL OF THESE PROVED ADVANT

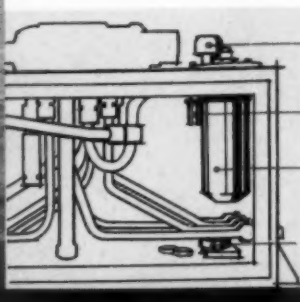
## unmatched s



## full control r



## 5-way hydrau



# NTAGES

## l stability

All three models offer higher wheelbase to length ratio for added overall stability. The kind of stability that lets you carry big loads at higher speeds over rough terrain . . . without tipping or spilling the load. Operators work with confidence on tricky loading operations, slope and stockpile work.

## l right in your fist

Exclusive single-lever control lets you go into and out of any speed, forward or reverse, with just a quick swish of your hand. Allis-Chalmers "one-stick" control makes fast work far easier by taking the time loss out of gear selection. Operators keep working at full capacity all day long.

## aulic filtering protection

Only Allis-Chalmers tractor loaders provide 5-way protection for the hydraulic system. Air is double filtered by: *1. air breather 2. air filter.* Hydraulic oil is cleaned by: *3. full-flow micronic filter 4. conical screen,* and *5. magnetic filter.* Complete filtering protection means peak operating efficiency . . . extended life. Filters are easily accessible for cleaning and replacement.

# WASHINGTON LETTER

by EDGAR POE

**Massive Blasting Operation**

A Bureau of Mines publication released recently presents in detail a massive blasting operation in a Wisconsin trap rock quarry. The method involved the detonation of 20 tons of explosives in two simultaneous, but physically separate blasts. A total of 225,000 tons of rock was broken. The Bureau said this was enough to keep the quarry busy more than a year. The blasting operation is known in the mining industry as the coyote-hole technique.

The Bureau explained that coyote-hole blasting, major charges of explosives are placed in coyote-holes or in tunnels parallel to the operating face. In most cases such discharges are followed by secondary blasting. Then the rock is crushed and screened to small sizes.

Lawrence G. Marshall, Minneapolis, Minn., mine examination and exploration engineer, authored the Bureau publication. He traced briefly the history and general operations of the Dresser Trap Rock Co., and of trap rock quarries elsewhere in the central states. Most trap rock from this operation now is channeled into concrete and roadstone, railroad ballast and filter stone for sewage-disposal plants.

**Saline water Office stepping Up its research**

Experts in the government say that just plain ordinary water may soon become the No. 1 domestic problem in this country. The problem of supplying enough water is getting to be more complex with the great population growth. Today the Office of Saline Water, created in 1952, is embarking on an all-out research program with land based pilot plants that will produce fresh water from the sea and other saline sources at low cost, with the emphasis on cost. Five processes and four sites for the demonstration plant program have been selected.

The fifth plant, to be located on the East Coast, will use a freezing process. It will be designed to produce up to 350,000 gallons of fresh water daily. Freezing is so new that there is an unusual amount of interest surrounding the process. The world's first freezing process pilot plant began operating last fall at the Carrier Corp. plant at Syracuse, New York.

The Office of Saline Water has awarded the Blaw-Knox Co. of Pittsburgh a contract to build a 35,000-gpd. pilot plant to test another freezing process developed at Cornell University.

J. W. O'Mera of the Office of Saline Water said the plants that the agency is getting ready to build will demonstate the progress that has been achieved through eight years of research. Said he: "We expect the two 1,000,000-gpd. demonstration plants to produce fresh water from the sea for about $1 per 1,000 gal. Our engineering explorations indicate that when these processes are incorporated in multi-million gpd. plants we will gain economies that will enable us to produce fresh water from the sea for less than 50 cents per 1,000 gal., and prices lower than that may be expected for the conversion of certain brackish waters."

**Army comes up With brake fluid**

Army researchers say they have come up with an improved preservative brake fluid for trucks and cars. The fluid was developed by the Army Ordnance Corps at Aberdeen Proving Grounds, Md. It avoids the excessive corrosion and gumming of hydraulic brake parts stored in standard brake fluid, has an acceptable boiling point and causes little deterioration of rubber. A new borax-glycol complex is combined with alkali. Details, including the formula, are available from the office of Technical Services, U. S. Department of Commerce.

**Congress unit Explains act**

Coastal and intercoastal water carriers have won a round in their fight with the ICC over interpretation of the 1958 Transportation Act. Senate Merchant Marine hearings resulted in a congressional report putting ICC on notice that the Act was not designed to promote competition between carriers to the point of putting the ship lines out of business. Several members of Congress have already maintained in stout terms that the law was not intended to be a "destructive tool."

**Dam pour Gets into Full swing**

Full-scale concreting operations are being initiated on a new phase of construction on the great Glen Canyon dam on the Colorado River in northern Arizona. Four years from now the mighty 700-ft. high multipurpose barrier is scheduled to be completed. Behind it will lie a 186-mile-long lake in deep Glen Canyon.

From a standpoint of funds expended, the $183,237,000 project is already considered complete, although there is little evidence as yet of a structure. The Bureau of Reclamation said that total cost of the dam, with power plant, switch yard and appurtenant features, will involve an outlay of $324,074,000. Placement of concrete will signal the start of a long-haul trucking job which is believed to be unequaled in construction history. Approximately 3 million bbl. of cement will be supplied from the new plant of Phoenix Cement Co. at Clarksdale, Ariz. (See ROCK PRODUCTS, May 1960, p. 114)

**Ready-mixed Concrete census Shows value**

Ready-mixed concrete industry manufactures shipped products valued at $1,658,000,000 during 1958, according to a recently released report by the Bureau of the Census. The report is one in a series that the Department of Commerce has issued this year in connection with commerce and industry.

Average employment in the industry showed a total of 60,900 employes. Value added by manufacture in the industry amounted to $659,000,000. Value added is derived by subtracting the cost of materials, fuels, etc., from value of shipments.

The ready-mixed concrete industry includes establishments engaged primarily in Portland cement concrete manufactured and delivered to a purchaser in a plastic and unhardened state. This industry includes production and sales of central mixed concrete and transit mixed concrete.

The ready-mixed concrete industry is included for the first time in the census of manufacturers for 1958. Thus no comparable figures are available. The report does not include figures for ready-mixed concrete administrative offices, warehouses, garages or other auxiliary units.

**Value of lime Products rose By 16 percent**

Manufacturers in the lime industry shipped products valued at $131,000,000 in 1958, according to a census of manufacturers issued in the spring by the Department of Commerce. The research was compiled by the Bureau of the Census. Although the value of lime products rose 16 percent from the previous census in 1954, average employment in this industry showed a 10 percent decrease or a total of 7,200 employes. Value added by manufacture in the industry amounted to $73,000,000 in 1958, a 27 percent increase from 1954.

The Census Bureau said the lime industry includes establishments engaged primarily in the manufacture of quick lime, hydrated lime, and dead-burned dolomite, shells or other substances.

**Small business Loans growing**

A $1,000,000 five-year, 5-percent loan, the biggest single transaction in the six-year history of the Small Business Administration, has been made to the Business Development Corp., Raleigh, N.C. The North Carolina organization plans to relend the funds to five diversified small businesses in the state in amounts from $150,000 to $350,000 for expansion, modernization or for construction of new facilities or land acquisition. SBA is making more and more loans to state and local development companies to stimulate business activities in localities of the borrowing companies.

**Special taxes Yield nearly Eight billion**

Special taxes levied in 1956 to help pay for the expanded highway construction program have produced $7.9 billion since July 1, 1956. The greatest yield, of course, came from the gasoline tax (80.6 percent). Diesel fuel brought in 2.3 percent; tires, 10 percent; tubes, 0.5 percent; tread rubber, 0.7 percent; trucks, busses, trailers, 4.3 percent, and vehicle use, 1.6 percent.

**Labor Department Complaints**

A special section to take care of employe charges of union violations under the Landrum-Griffin Act passed at the 1959 session of Congress has been created by the Labor Department. Labor Department officials say the number of complaints reaching the Department is increasing with a current average of more than 200 a month. What are some of the complaints? Some of the letter writers charge violation of election provisions; violation of embezzlement provisions; disclosure that a union officer has been convicted of felony and thus ineligible for holding union office; unlawful disciplinary action against a union member, and numerous other allegations.

# 25% more hole per hr.

## in hard limestone with high silica content

***...than with competing rig***

Quarry performance like this is standard with REICHdrill. Why? Because:

- ...all-hydraulic top-drive rotary provides infinitely variable speed of drill rotation – the right speed for every formation.
- ...direct-drive to drill stem saves power loss.
- ...all air used to drill and clean hole.
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- ...instant safety torque release protects all drive components.

REICHdrill has built a reputation for keeping maintenance costs low; footage records high.

And these additional REICHdrill features help set drilling records: masts incline for angle drillings; CP heavy-duty compressors assure plenty of air to meet all demands; fast-acting, ram-type hydraulic leveling jacks permit use of most rig weight for down pressure; CP "Air-Blast" Bits for extra footage in toughest formations.

*For further information, write:*

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1439 ASH STREET, TERRE HAUTE, INDIANA
Division: CHICAGO PNEUMATIC TOOL CO.

*T-650 truck-mounted REICHdrill operating in a quarry. Hole size: to 7⅞"; down pressure: 30,000 pounds. Other models available, truck or crawler mounted, with hole size to 16 inches, down pressure to 90,000 pounds.*

Enter 1405 on Reader Card

# LUBE LOGIC Tips for more

## How to put engines in mothballs

As hard as you try to keep all your equipment at work all the time, invariably there'll be times when you just have to prepare a piece of motorized equipment for an idle stretch. Long idle periods can take a heavy toll on an unprotected engine. These eleven steps assure you that the engine will be in as good condition when you start it up again as it was when you put it away.

**1** Run the engine for a while and drain the oil while it's hot. Install new filter element.

**2** In mild climate, drain and flush cooling system and refill with rust-inhibited water solution. In subfreezing climate, drain, flush and refill with rust- and corrosion-inhibited anti-freeze.

**3** Refill crankcase with Texaco Ursa Oil Heavy Duty, idle the engine fast for about 20 minutes, and shut it down. For diesel engines, add 3% Ursa Oil Heavy Duty (of correct seasonal grade) to the fuel before this idling period, and afterward fill the tank with a good diesel fuel.

**4** Remove spark plugs and squirt a little Ursa Oil Heavy Duty into spark-plug holes while engine is being turned over. Dip plug electrodes in Ursa and replace.

**5** Coat each lobe of distributor breaker cam with Texaco Rustproof Compound L. Replace distributor cap and seal breather hole in cap with waterproof tape.

**6** On ohv engines, remove valve cover and squirt Ursa Oil Heavy Duty on rocker mechanism, interior of valve cover, and between cylinder block and side plate cover.

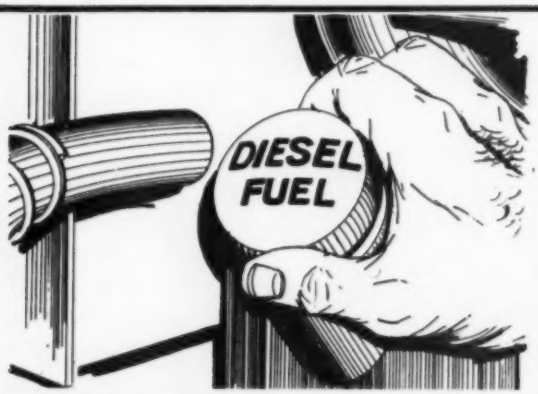
**7** On gasoline engines, drain fuel tank, lines, pump, strainer and carburetor. Afterward, close all openings and reconnect all fittings.

**8** Remove battery, store it in cool dry place, keep water level up. Recharge periodically. Apply Texaco Rustproof Compound L to battery terminals, leads and container. Loosen fan belt; insert paper between belt and sheaves.

**9** Clean and dry outside of engine. Touch up unpainted spots with Texaco Rustproof Compound L.

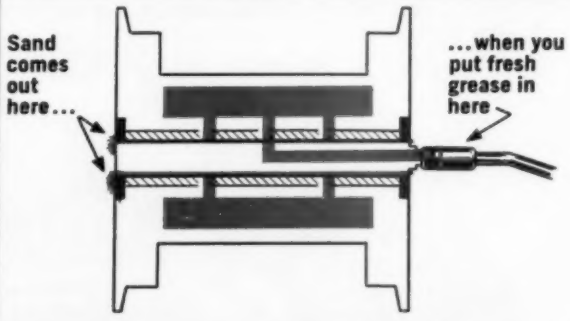
**10** Seal engine air intake, breathers, exhaust and exhaust expansion joints with waterproof tape or heavy paper secured with waterproof tape.

**11** Tag engine and engine parts with detailed information on rustproof measures taken.




## Identify the fuel you want

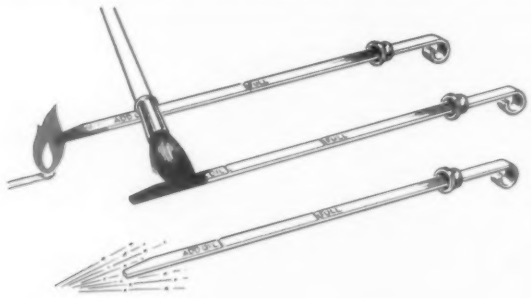
Let one absent-minded maintenance man put gasoline in your diesel tank and as the fliers say you'll be "bailing out over Denver." It's happened. Best way to avoid its happening to *you* is to mark your fill cap; "Diesel Fuel" or "Gasoline." Then nobody should make any mistakes.




## Track-roll enemy No. 1: sand

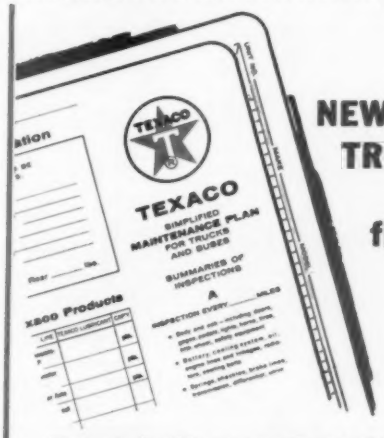
If you're operating a crawler-tractor in sandy soil, the best way to keep sand from getting into the track-roll bearings is to keep purging the bearings with fresh grease. Most track-roll bearing seals are especially designed for this type of purge-lubrication, and the grease that comes out around the edges of the seal during lubrication carries the sand out with it.

# efficient maintenance



## How to read dipsticks without squinting

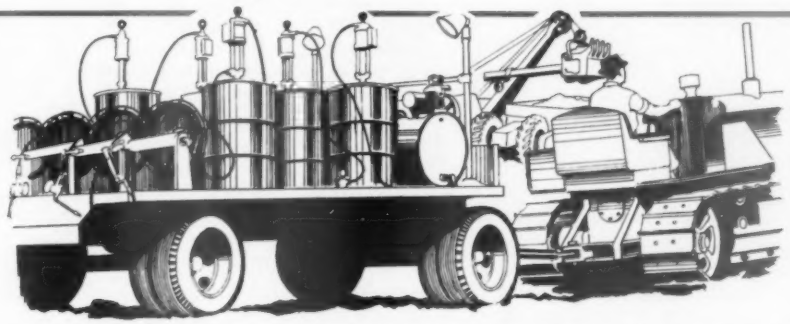
The modern inhibited motor oil that keeps the inside of your engine clean also keeps the oil dipstick clean—and often too shiny to read. Here are three solutions for this problem—take your choice. 1. Heat the end of the dipstick so that the metal darkens slightly. 2. Paint the end of the stick with a dull-finish cellulose lacquer. 3. Run the stick across the spark-plug cleaner to take off some of the shine. (If you use the spark plug cleaner, use the smallest rubber plug bushing and hold the dipstick over the hole with a wad of cloth to keep sand from scattering around the lube box.)




## NEW TRUCK RECORD FOLDER fits itself into your schedule

Texaco's flexible new truck record folder lets you stick to the lube schedule that works best for you without running into bookkeeping problems. Lubrication and oil schedules are completely separate from mechanical maintenance and replacement parts schedule—you don't have to follow any pre-established routine to use the folder profitably. And this new folder accounts for every single dollar you spend on truck maintenance for a whole year. Get yours now.

## Do-it-yourself lube rig trailer



Maybe you're aware of all the advantages of a mobile lube rig, but just don't want to tie up a truck for this purpose. Or, perhaps you'd like a supplementary rig. You can solve either problem neatly by mounting your field lubricating equipment on a standard 5-ton farm trailer. That way, you can take your whole Simplified Lube Plan out into the field where it's needed, without costly deadheading back to a fixed service point—and you can move the lube rig just by hitching it to any truck, so it's just as mobile as a truck-mounted rig at much less cost. And here's a bonus: by hitching your lube rig trailer to a bulldozer, you can take field service to spots that wouldn't be accessible to a regular truck.

Trailers for this purpose, as well as tanks and pumps, are all standard items you assemble yourself to meet your own requirements.

## TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers", little angles, so easy to overlook, where big savings in money and time can be made. But month in, month out, your local TLE is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."

Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

**TEXACO**

*Throughout the United States*

*Canada • Latin America • West Africa*

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# LABOR RELATIONS

A ROUNDUP OF ACTUAL DAY-TO-DAY IN-PLANT PROBLEMS AND HOW THEY WERE HANDLED BY MANAGEMENT MEN

## How would you decide?

### Can management use a point system of discipline to curb absenteeism?

*What Happened:* Absenteeism and lateness became so big a problem that management decided to take drastic measures. It set up a system of "progressive discipline" based on points. For each absence and/or lateness the employe was given one point. When he received 2 points in any one-month period, the worker was warned; 3 points drew a week's layoff, and 4 points meant discharge.

The first 2 points were imposed for any absence. Points 3 and 4 were excusable if the employe could show that there was an acceptable reason for his neglect to come to work or for his having come late.

The union objected on two grounds:

1. You cannot institute a penalty program without negotiating the changes with the union.
2. You cannot penalize for general absences. An employe must be given a chance to show reasonable cause for any absence.

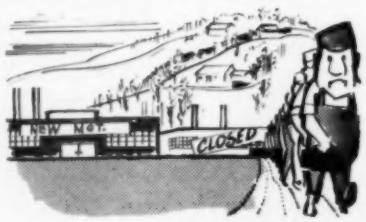
Management answered:

1. If absenteeism threatens our business, we have a right to do what is necessary to keep us from going broke.
2. Management doesn't have to put up with excessive absences no matter how good the employes' reasons.

**Was Management:**
**Right?** ☐ **Wrong?** ☐

*What Arbitrator Wallen ruled:* "Management may lay down reasonable rules to govern attendance just as it may to govern other aspects of in-plant conduct such as discipline and safety, without prior negotiation. But under this program, the employe who malingers through four absences receives more consideration than the one who is legitimately ill on two occasions but whose two subsequent absences are deemed not to be excusable. The feature of the program which penalizes an employe regardless of cause is not reasonable."

### When an employer closes down some of his operations, can he discharge excess workers or must he put them on layoff status?




*What Happened:* When a new management took over it decided to close down some of its unprofitable operations. As a result, 12 employes lost their jobs. They were given severance pay and let out. The workers protested:

1. We should be put on layoff because when business improves the company may start these operations again.
2. If we are on layoff status, we lose no benefits—we would still be entitled to some holiday pay, vacations and other fringes for a year until our layoff clause ends.

The company answered:

1. A layoff is used only where there is a lack of business and there is an expectation that things will improve. But that's not the case here. We are closing down some of our operations permanently.
2. If we put these employes on layoff, we would be saddled with additional uneconomic costs because the workers would be entitled to certain benefits.
3. We agree that if at some time in the near future we revive these operations, we will seek out these 12 terminated employes.

**Was the company:**
**Right?** ☐ **Wrong?** ☐

*What Arbitrator Garman ruled:* "The arbitrator is influenced by a feeling that it is neither logical nor equitable for the company to provide fringe benefits to persons who perform no work at all for a period of a year or even longer. One troublesome point remains. It would be unfair to permit the company to terminate the 12 employes and later hire other new employes. Some collective bargaining agreements contain protection on this score by stipulating that terminated employes will retain rehiring seniority rights for limited periods of time such as one or two years. The arbitrator accepts the company's statement that it does not envision the need for more employes within the next couple of years, and agrees with its statement that it will have a clear moral obligation to offer priority employment to the 12 persons involved in this case."

*(Continued on page 34)*

# These Special Excavating Jobs Are Best Handled by Sauerman DragScrapers

## Deep Digging

**900-FT. SPAN— 65 FT. BELOW WATER...**

*Load is deposited by tensioning the track cable, thus lifting the DragScraper from the pile. Tensioning continues to the desired height for releasing the DragScraper and returning it by gravity to the pit.*

*Operator controls digging and hauling from cab in head tower.*

**"the 10-yd. DragScraper is doing a wonderful job and we could not operate without it..."**

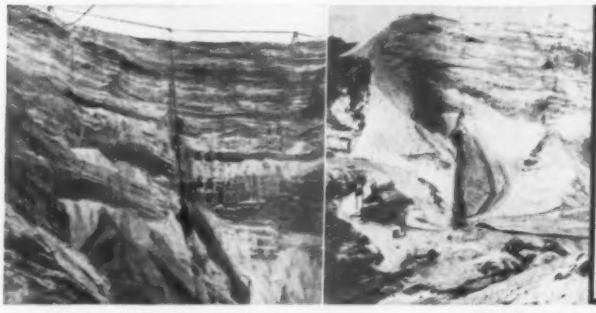
*Louis Chinelli, Gen. Supt.*
*Redman Concrete Corp.*

Redman had been trucking material at a cost of $35,000 a year to the location where the DragScraper is now placing it. The 10-yd. Sauerman covers a pond area of 1500′ by 3000′ and is digging 40 ft. deeper than their previous dragline could operate.

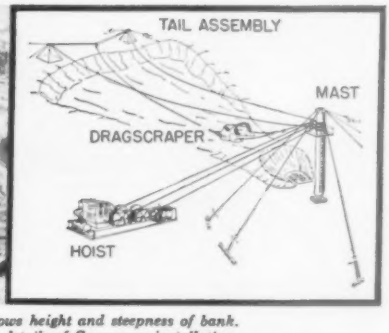
The DragScraper digs and hauls on a 900-ft. span. It operates between a 90-ft. fixed head tower and a 40-ft. mobile tail tower which may be shifted to change the line of operation. The company's 1000-yd.-per-day batch plants and its fleet of mixers and trucks are kept busy by the steady flow of material supplied by the DragScraper.

## High Bank Digging

**175 FT. HIGH— 600-FT. HAUL...**



*DragScraper digs from high bank.*




*Overall view shows height and steepness of bank. Diagram shows details of Sauerman installation.*

**"I have nothing but praise for our 4-yd. Sauerman Machine. Since the DragScraper began operations in 1952, we have worked it continuously 12 hours a day..."**

*John D. Robertson, Gen. Supt.*
*Chandler's Palos Verdes Sand & Gravel Co.*

By working down from the top of the 175-ft. bank, the material flows ahead of the DragScraper. This provides bonus loads on each haul and substantially lessens the danger of cave-ins.

Operating cables are powered by a Sauerman three-drum electric hoist. Equipped for rapid shifting, the DragScraper can be quickly positioned to any line of operation between the two tail towers at the top of the bank and the headpost at the hopper.

The plant is the largest sand producer in the South Los Angeles area and, together with two ready-mix plants, keeps 22 ready-mix and 18 dump trucks busy.

---

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, the depth and plant layout. Consult Sauerman engineers about your plant. Their recommendations will be based on fifty years of excavating machinery experience. Ask for Catalog A (DragScrapers). Sauerman News Nos. 149 and 150 describe the above installations in greater detail.

**SAUERMAN BROS. INC.** 630 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS

CRESCENT SCRAPERS • BLACKLINE and TAUTLINE CABLEWAYS • DURO-LITE BUCKETS

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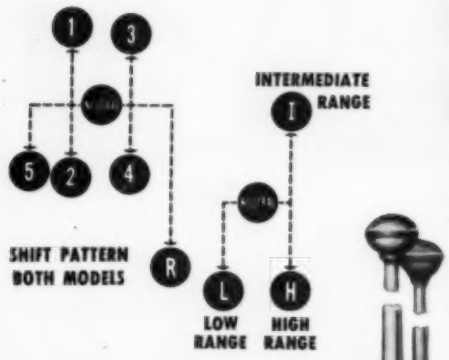
# NEW Fuller Heavy-Duty

## 10 closely-spaced gear splits plus deep reduction ratios




**MODEL 15-G-[illegible]**

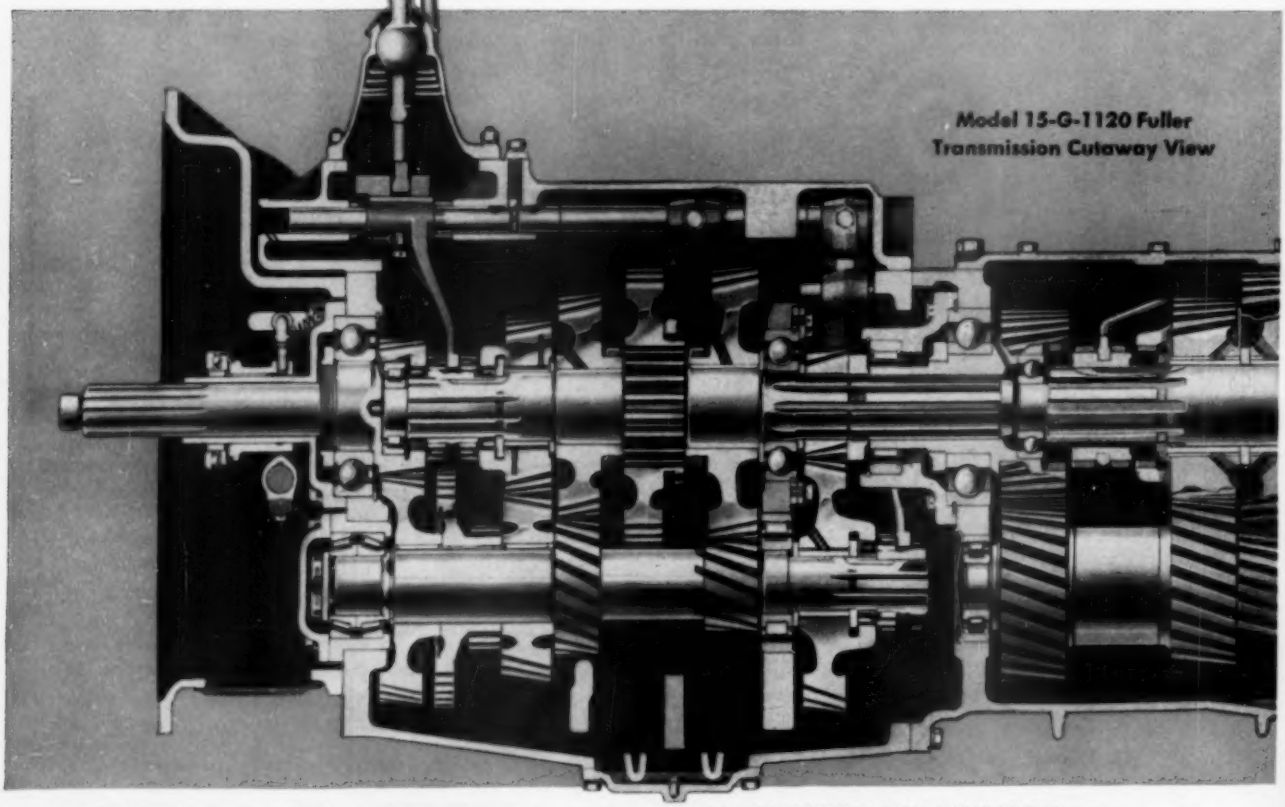
**MODEL 15-G-1120**

Fuller now offers two new 15-speed transmissions engineered for on and off-highway diesel truck operations demanding high capacity, long wear life and ease of operation . . . for logging, mining, construction, oil-field work, aggregates and ready-mix.

Advantages of the new transmissions include:

1. Extremely short installation dimension, which permits shorter wheelbase for tractors which formerly incorporated main and auxiliary transmissions.

2. Maximum operational flexibility with not only 10 closely-spaced gear splits, but also 5 speeds avail-



Model 15-G-1120 Fuller Transmission Cutaway View

**FULLER** TRANSMISSION DIVISION MANUFACTURING COMPANY KALAMAZOO, MICHIGAN

[illegible] • Sales & Service, All Products, [illegible] • Subsidiary, Automotive Products Company, Ltd., Automotive House, Great Portland Street, London W.1, England. European Representative

# 15-SPEED TRANSMISSIONS

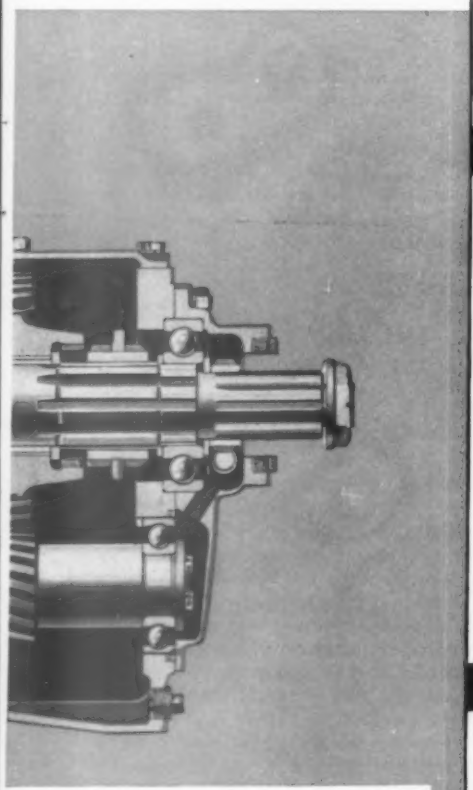
*designed for combination on and off-highway applications*

able for low range operation through a deep reduction in the auxiliary.

3. A wide choice of optional gear ratios to match every job requirement.

4. Weight reduction obtained by eliminating support brackets, joints, cross members and a propeller shaft.

For full details on the Fuller 15-G-1120 and 15-H-1120 Transmissions, ask your dealer or write Fuller Manufacturing Company.



**Subsidiary of EATON Manufacturing Company**

## Model 15-G-1120: Standard Gear Ratios

| SPLITS—OVER-HIGHWAY | | | | LOW RANGE—OFF-HIGHWAY | | |
|---|---|---|---|---|---|---|
| Speed | Split | Ratio | % Step | Speed | Ratio | % Step |
| 10th | O'Drive-High | .636 | 33 | 5th-Low | 1.33 | |
| 9th | O'Drive-Int. | .844 | 19 | | | 57 |
| 8th | Direct-High | 1.00 | 33 | 4th-Low | 2.09 | |
| 7th | Direct-Int. | 1.327 | 32 | | | 76 |
| 6th | 3rd-High | 1.76 | 33 | 3rd-Low | 3.68 | |
| 5th | 3rd-Int. | 2.32 | 41 | | | 86 |
| 4th | 2nd-High | 3.27 | 33 | 2nd-Low | 6.83 | |
| 3rd | 2nd-Int. | 4.33 | 51 | | | 100 |
| 2nd | 1st-High | 6.54 | 33 | 1st-Low | 13.67 | |
| 1st | 1st-Int. | 8.68 | | | | |

## Model 15-H-1120: Standard Gear Ratios

| SPLITS—OVER-HIGHWAY | | | | LOW RANGE—OFF-HIGHWAY | | |
|---|---|---|---|---|---|---|
| Speed | Split | Ratio | % Step | Speed | Ratio | % Step |
| 10th | O'Drive-High | .636 | 33 | 5th-Low | 1.68 | |
| 9th | O'Drive-Int. | .844 | 19 | | | 57 |
| 8th | Direct-High | 1.00 | 33 | 4th-Low | 2.64 | |
| 7th | Direct-Int. | 1.327 | 32 | | | 76 |
| 6th | 3rd-High | 1.76 | 33 | 3rd-Low | 4.65 | |
| 5th | 3rd-Int. | 2.32 | 41 | | | 86 |
| 4th | 2nd-High | 3.27 | 33 | 2nd-Low | 8.63 | |
| 3rd | 2nd-Int. | 4.33 | 51 | | | 100 |
| 2nd | 1st-High | 6.54 | 33 | 1st-Low | 17.27 | |
| 1st | 1st-Int. | 8.68 | | | | |

## Optional Gear Ratios: Models 15-G-1120, 15-H-1120

**Overdrive:** .85, optional at extra cost
**Overdrive:** .74
**Reverse:** 5.06

*Enter 1410 on Reader Card*

*continued from page 30*

### Can you discipline a union officer if he refuses to pass a picket line set up by a rival organization?

*What Happened:* Joe Morris, president of the local union, came to work one morning only to find the entrance blocked by pickets. He quickly noted that these placard carriers were not members of his union, but that they belonged to a rival outfit which was trying to horn in.

Morris stood around a while. He then decided that the pickets were hostile and that he might get hurt if he forced his way in. The next day when Joe came to the plant, the police were on hand and the picket line was quiet. But he still hesitated to enter the plant —and the rest of the employes did likewise.

The company got an injunction against the illegal pickets and work was resumed. But Joe Morris was fired when he came back to his job. The company gave these reasons:

1. As a union officer, Morris had an obligation to lead the way and walk through that picket line.
2. We have a no-strike clause in the contract and the union must live up to it.
3. We had police protection, so on the second day Morris would have been perfectly safe in coming through the picket line to work. He balked, which meant that he gave support to that other union.

Morris's defense was:

1. I may be a union officer but that doesn't mean I have to get my head broken.
2. I did my best to get the pickets to disband.

**Was the company:**
**Right?** ☐ **Wrong?** ☐

*What Arbitrator Davis ruled:* "The grievant did not measure up to his full obligation as a union officer administering a contract that contained a no-strike, no-work-stoppage clause. Because he did not, he made himself liable to disciplinary action. Because of his failure to live up to his full responsibilities, Joe Morris was properly subject to a long disciplinary layoff. But discharge is too severe because there was an element of personal danger involved. The employe shall be reinstated in his job no later than two working days after the receipt of this award, without back pay."

### Can management require that inspectors do minor repairs?

*What Happened:* The company had a policy which said that no employe should perform work in a higher classification. In order to save time, management directed that when materials came into the inspection department for final checkup, the inspectors were to repair any small imperfections there might be.

The union objected strenuously to this procedure claiming that this was taking work away from the machinists. Management didn't see it that way. It maintained that the small repairs involved did not require any skill or training. A small file, some sandpaper or emery cloth were all that was necessary. This was no burden to the inspection department. The use of a file or sandpaper didn't mean that the inspectors were working in a "higher classification." To route the stuff back would only add to the costs.

"We still don't agree. Let's arbitrate," said the union—and the management said okay.

**Was the union:**
**Right?** ☐ **Wrong?** ☐

*What Arbitrator Rohman ruled:* "It is a well-accepted principle in the field of labor-management arbitration that where the job description does not specifically delimit the particular tasks, and where the deviations are minor; and the task involved is simple, requires no training and is completed in a few minutes—then the added duties are reasonable. Furthermore, this action by management has not deprived any employe of earnings or seniority —and the expense involved in routing the materials to another area would be costly. In view of the above, I find the company's action proper."

### Can an employe be fired because he filed a $100,000 slander suit against his boss?

*What Happened:* One morning John X was called into the manager's office and told that he was "strongly suspected" of having stolen another employe's billfold. John maintained his innocence. The company said that it did not judge John guilty—only that a preliminary investigation pointed a finger of suspicion at him.

A few days later he was called back and told that the investigation had been dropped because no positive proof was obtained against him. Whereupon John filed a suit for slander against the firm in the amount of $100,000.

When the company received notice of the suit, it fired John X claiming:

1. If John feels we have damaged his good name to the tune of $100,000 then we certainly cannot maintain good relations with him.
2. John is forcing us to spend a lot of money in defending ourselves.
3. We have investigated the theft and completely absolved him of any fault.
4. Besides we are innocent of any wrongdoing and John is just trying to harrass us. We don't want any such employe.

John's defense was that he had filed a civil suit and couldn't be fired for such action any more than a worker who sues for Workmen's Compensation can be discharged.

**Was John X:**
**Right?** ☐ **Wrong?** ☐

*What Arbitrator Larson ruled:* "The Arbitrator is of the opinion that 'proper' or 'just cause' did not exist for the discharge of John X. The institution of a suit cannot be said to impair relations between the aggrieved and the company in such a degree as to justify discharge. Grievant was one of hundreds of employes. There was no evidence that he had personal contacts with the vice president or other high executive officers. There is no evidence that the quality of grievant's work would be affected by the pendency of the law suit.

"Possibly there would be unfriendliness or coolness between John X and the plant production men. But there is no basis for inferring that grievant's work performance would suffer. John X is to be reinstated with back pay."

**END**

# STEPHENS-ADAMSON

## BELT CONVEYOR

**handles greater tonnage at lower cost**

Tons of crushed stone and aggregates are carried fast, efficiently and at a lower cost per ton on STEPHENS-ADAMSON Belt Conveyors. S-A quality engineered conveyor components increase materials handling efficiency while reducing equipment "down time" to a minimum. Long-lasting, low maintenance dependability is built into every S-A belt conveyor. Convey with S-A . . . the Equipment that's designed and built by the men who know conveying best . . . STEPHENS-ADAMSON.

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**STEPHENS-ADAMSON MFG. CO.**

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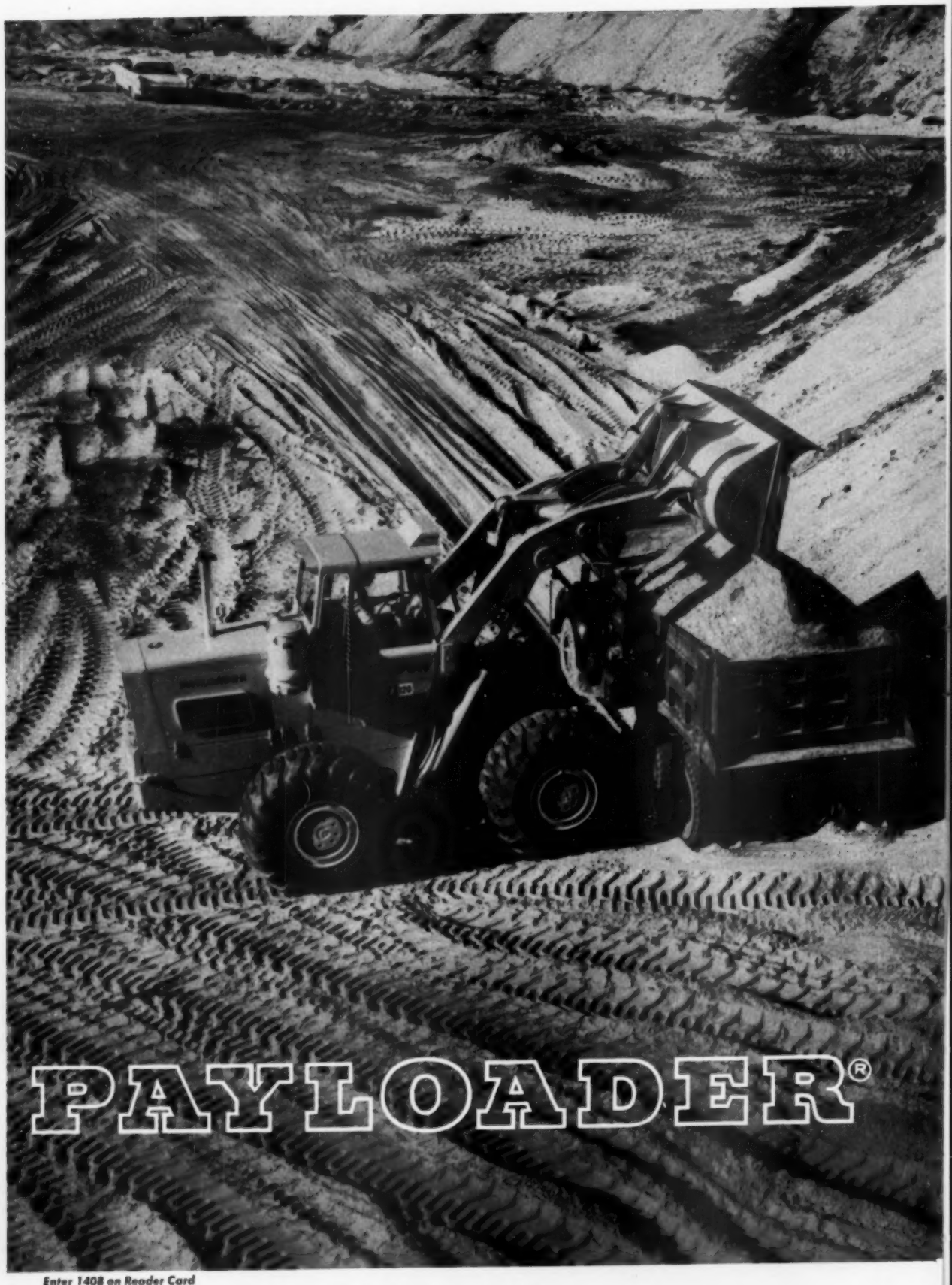


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## Reports continue to show H-120 setting unmatched standards of production and

# performance

**Owners and operators testify that this tractor shovel outperforms and outproduces larger, more costly machines**

*Superintendent Says:* "This machine has plenty of power to get maximum loads under all working conditions. The roll-back bucket action heaps and keeps the full load during delivery cycle. The material just seems to flow into the bucket during digging with an absolute minimum effort and no strain whatsoever. The high lift and long reach enables the operator to distribute the load on the truck, enabling the trucker to haul a maximum balanced load to state road specifications."

*Owner Says:* "The H-120 is fast and maneuverable, does numerous jobs that save us time and extra equipment."

*Operator Says:* "Jobs just don't come too big for this machine. Has power to spare. The H-120 gives maximum traction with no wheel spin. I like the comfort and ease of operation. It is a well balanced machine."

*Operator Says:* "The H-120 has unmatched pry-out power and more digging power than any other large rubber-tired loader. The machine never runs hot no matter how hard the digging gets. It has good load-carrying balance."

*Plant Manager Says:* "We needed a versatile machine for large truck and rail car loading and the H-120 with its long reach was the answer to our needs. This unit gives us a 15-foot reach with ease and has very efficient loading speeds. It never uses full power and it fills the bucket with minimum effort. The H-120 has replaced two other loading machines."

*Operator Says:* "I like the H-120 better than anything I've ever run. It's faster, comfortable and easy to handle. The balance is perfect and the safety and visibility is tops because of the lift arm design. The high lift and long reach let me center loads in gondolas of rail cars."

*Owner Says:* "The additional capacity of the H-120 and its faster load-out speeds has cut our basic hauling equipment needs in half on the pit-to-plant short haul operation. The high reach of the bucket gives evenly distributed loads which makes it easier on the hauling equipment."

*Operator Says:* "I know I can handle at least 400 tons per hour and that includes a lot of moving from screen plant to conveyor, or hopper or stockpile. I like the feeling of balance and complete control at high speed operation of this big loader. It may not seem important but there are no sickening fumes coming from a fuel tank filler cap under my nose and there are no lifting arms sweeping past my elbows. I consider it the safest, easiest operating loader I have seen in my long construction experience."

*Superintendent Says:* "The better balance, speed and maneuverability of the H-120 makes it a better buy than larger competitive models tested on the job."

*Operator Says:* "I haven't had to work very hard since putting the H-120 loader on the job. Even with a 23 truck fleet on a short haul, I am waiting for trucks. One day we moved 5,800 tons and could better that if we had a few more trucks. This unit is the fastest working big loader we have ever tried. It's a dream to operate with power controls, fast responses and clear, open vision of the bucket and of the area all around the loader at all times."

You must see the H-120 in action to appreciate its outstanding performance – how it can put out big yardage so easily. With buckets from 4 to 8 cu. yds., more horsepower, higher dumping clearance (10'10"), longer reach (3'6") and many other superior features it is the big news in tractor-shovels. See your Hough Distributor today, or return the coupon.

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THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
705 Sunnyside Ave., Libertyville, Ill.

Send full data on the big Model H-120 "PAYLOADER."

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Title_____

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*Make more profit on the jobs ahead with . . .*

# SYMONS® CONE CRUSHERS

## FOR VOLUME PRODUCTION OF QUALITY AGGREGATE

These dramatic views of sections of the important new Illinois Tollway system serve as an outstanding example of the vast contributions to the progress of mankind being made by the construction industry. In huge construction projects such as this, specification aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate used in concrete and bituminous highways, Symons Cone Crushers are today, more so than ever before, the first choice of leading producers throughout the world. Symons Cone Crushers are also used in sand preparation operations.

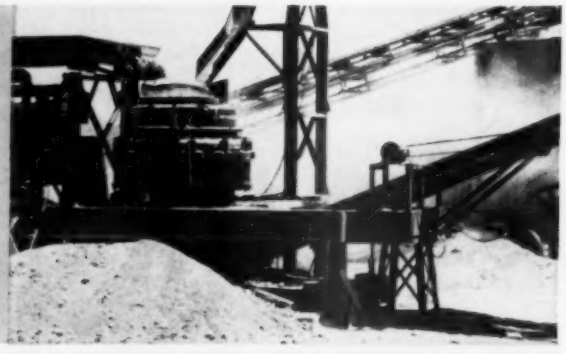
For in aggregate and sand production . . . *as in all of the great ore and industrial minerals operations the world over* . . . no record equals the performance of Symons Cone Crushers that have so consistently produced, economically and efficiently, great quantities of finely crushed product resulting in higher profit per ton per hour.

Before you submit *your* next bid, get full information about Symons Crushers.

*SYMONS . . . a registered Nordberg trademark known throughout the world*

### FOR STATIONARY PLANTS

Symons Cone Crushers, in Standard and Short Head types, are the choice of leading contractors and producers for primary, secondary and finer reductions in all types of aggregate operations. Available in sizes from 22" to 7' in diameter, for capacities from 6 to 900 or more tons per hour.



### FOR PORTABLE PLANTS

Symons Cone Crushers are being used in increasing numbers for portable and semi-portable crushing plants. View shows part of a Cedarapids portable crushing and screening plant, utilizing a Symons Cone Crusher. Unit is serving a large Texas aggregate producer.

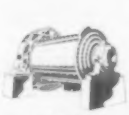
C-160

ILLINOIS TOLLWAY

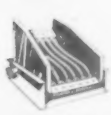
(ABOVE:) Tri-level interchange of Northwest and Tri-State Tollways near Chicago's O'Hare International Airport.

(RIGHT:) View of the modern Northwest Tollway bridge crossing the Fox River near Elgin, Illinois.

SYMONS PRIMARY GYRATORY CRUSHERS

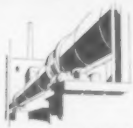


NORDBERG GRINDING MILLS

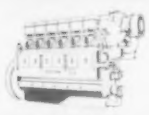


SYMONS VIBRATING GRIZZLIES

SYMONS VIBRATING SCREENS



ROTARY KILNS AND DRYERS



NORDBERG ENGINES

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SYMONS SCREENS NORDBERG

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# PEOPLE IN THE NEWS

## Woodville Lime Products elects new president

GEORGE C. URSCHEL, JR. (photo) has been elected president and chief executive officer of The Woodville Lime Products Co., Toledo, Ohio, in addition to his duties as vice president in charge of production. He succeeds his father, George C. Urschel, who becomes chairman of the board.

George Urschel, Jr., has been with the company since 1945. He served as purchasing agent until 1948 when he was appointed sales representative. He was made plant manager in 1952 and vice president-production in 1954. A native of Toledo, Mr. Urschel is a graduate of DeVilbiss High School and attended Cornell University.

Other officers of the company are Joseph J. Urschel, vice president of sales, and J. Robert Cowell, secretary-treasurer.

## Morgan succeeds Knode as U. S. Gypsum president

GRAHAM J. MORGAN (photo) has been elected president of United States Gypsum Co., Chicago, Ill. He succeeds Oliver M. Knode, who is retiring after serving as president for 16 years. Clarence H. Shaver is chairman of the board.

Mr. Morgan joined U. S. Gypsum in Minneapolis in 1939. He served as salesman, district manager and division manager, then as manager of insulation products and general merchandise manager. In 1953 he was named vice president of merchandising, and a year later was named assistant to the chairman of the board. He became executive vice president in 1959.

Mr. Knode started his career in the gypsum industry in 1897 at a small gypsum mine and manufacturing plant in Oakfield, N.Y. Five years later, when the plant became part of U. S. Gypsum, Mr. Knode came to Chicago

as assistant operating manager. He was named executive vice president in 1931 and president in 1936. He retired as president in 1942, but came out of retirement in 1949 to resume his former position.

## American Cement officers

GARNER A. BECKETT, formerly chairman of the board of directors, American Cement Corp., Philadelphia, Pa., has been elected honorary chairman of the board, and Allen L. Chickering, Jr., has been elected chairman of the board, succeeding Mr. Beckett.

James P. Giles, Jr., president of Hercules Cement Co., has been elected executive vice president of American Cement Corp.

Mr. Beckett has been active in the cement industry since 1921 when he joined Riverside Cement Co. He was elected president in 1936 and held that position until 1957 when Riverside became a division of American, at which time he was named chairman of the board. Mr. Beckett graduated from the University of Pennsylvania with a degree in civil engineering.

Mr. Chickering, a graduate of the Hastings Law School of the University of California, is a member of the San Francisco law firm of Chickering & Gregory. He had been a director of Riverside Cement before its merger into American Cement.

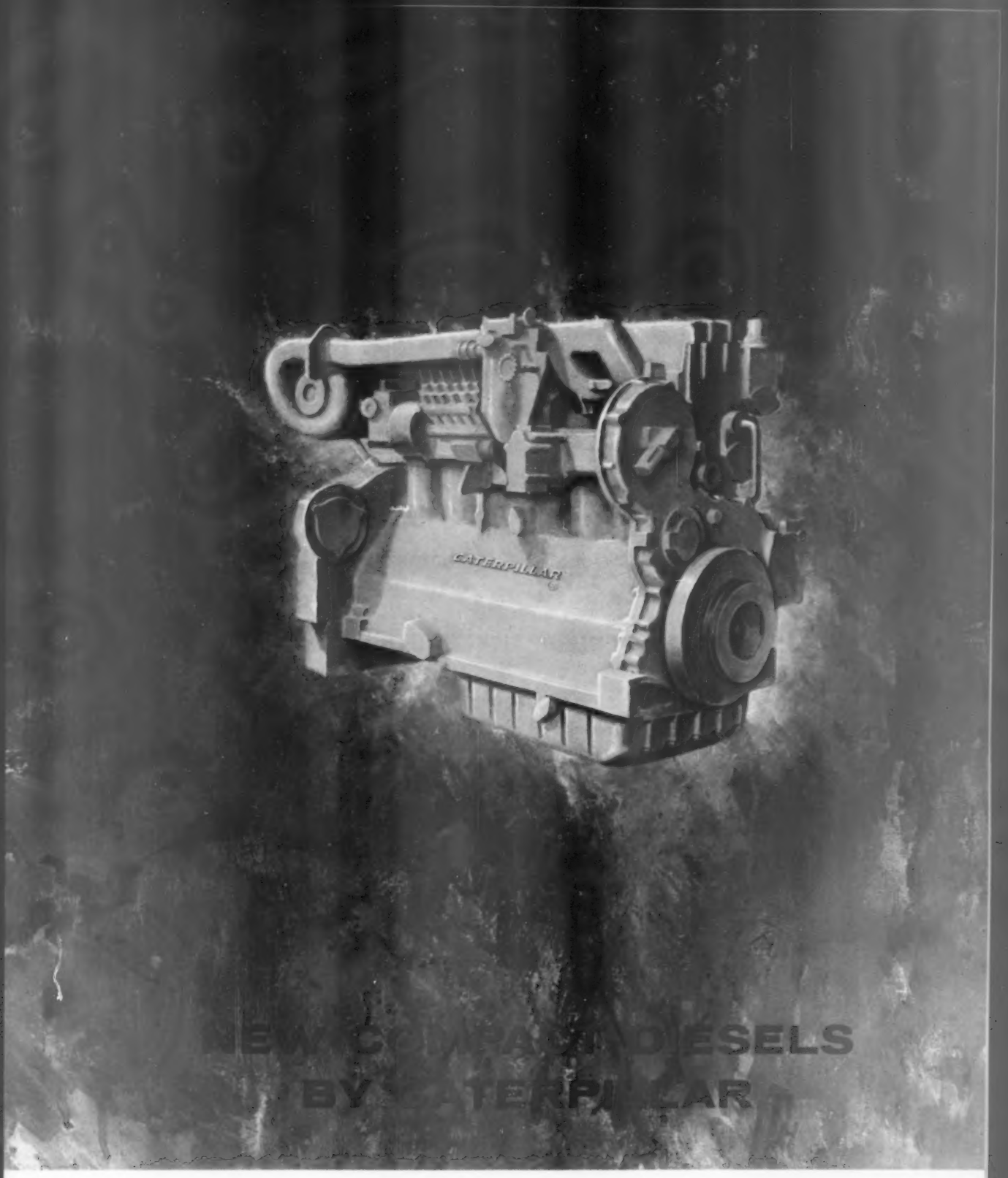
Mr. Giles joined Hercules Cement Co. in 1951 as assistant to the president. In 1954 he was named assistant general manager and in 1955 was made general manager. In 1956 he was appointed vice president and general manager and was elected president of Hercules in 1958. A graduate of Texas A. & M. College with a degree in chemical engineering, Mr. Giles is also a director and member of the executive committee of American Cement Co.

## Project manager for Indian cement plant

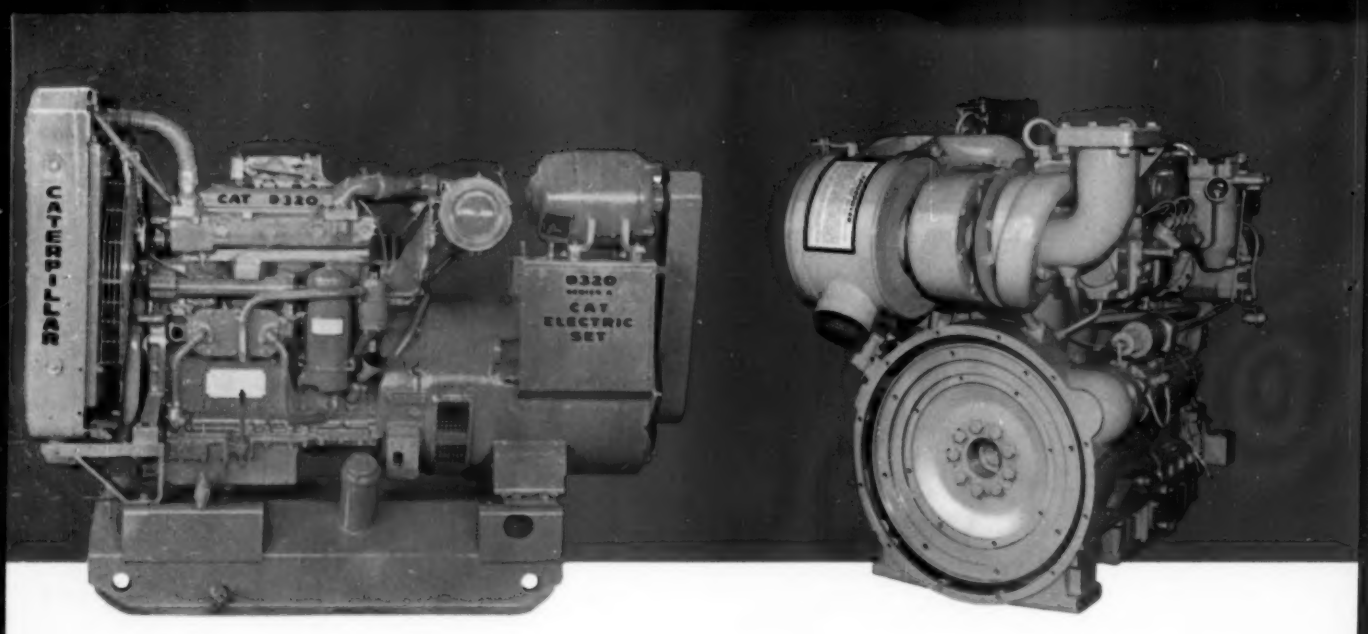
R. W. FISHER, JR., formerly principal engineer with Kaiser Engineers, Oakland, Calif., has been elected a vice president of Kaiser Engineers Overseas Corp. His first assignment is project manager of a 100,000-ton per year portland cement plant being designed and constructed for Mysore Cements Ltd., at Ammasandra, Mysore State, India.

A civil engineering graduate of the University of California at Berkeley, Mr. Fisher joined the Kaiser organization in 1941 and worked on the design of a new cement plant at Lucerne Valley, Calif., and an expansion program for the Permanente cement plant.

*(Continued on page 45)*




Caterpillar announces a new line of four-cycle diesels that sharply reduces physical dimensions and weight-to-horsepower ratio. Features of durability, fuel economy and dependability, long associated with Caterpillar four-cycle diesels, are still apparent.




**D320...130 HP**
(Shown as Electric Set*)

**D330...180 HP**
(Shown as Industrial Engine*)

## NEW FROM CATERPILLAR—HIGH OUTPUT, LIGHTWEIGHT, COMPACT DIESEL ENGINES

Since introduction of the first mobile diesel engine in 1931 Caterpillar engineers have been testing materials and methods to reduce diesel size and weight and at the same time develop more horsepower. Three products of this program are the new D320, D330 and D333. Their size, performance and price now offer significant and increased economic return to the user.

Now you can get premium four-cycle performance . . . and what is very important to you . . . at no premium in price.

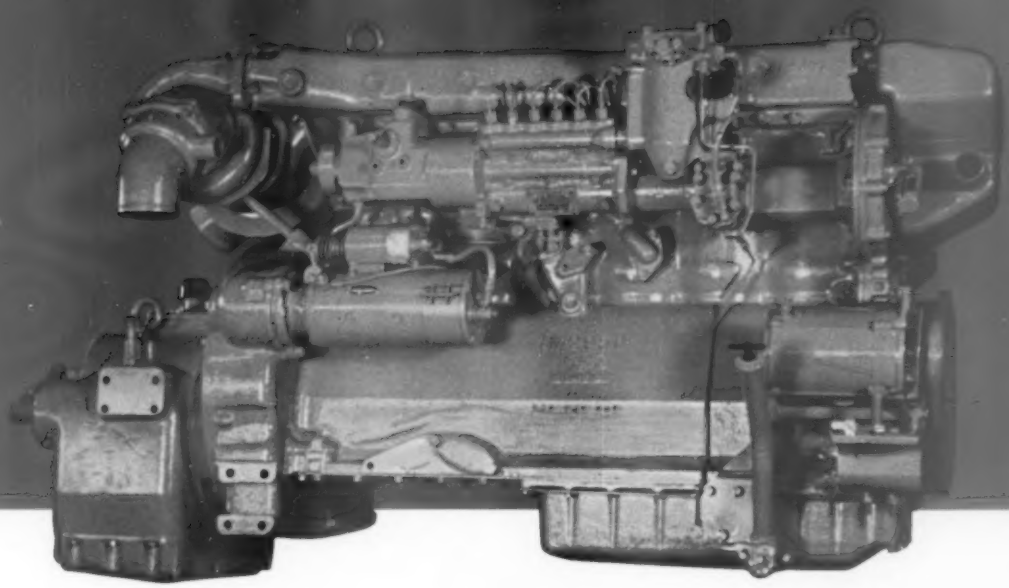
These engines and the rest of the Cat Diesel line are designed for your job or manufacturers' equipment whether it be industrial, electric power generation or marine.

Shown below are more models. Space prevents the illustration of Caterpillar's complete line running to hundreds of configurations.

D311H POWER UNIT

D337 EXCAVATOR MODEL

Caterpillar manufactures a full line of diesel and natural gas engines. Diesels range in horsepower up to 730; output of the largest electric set is 400 KW. Diesels are available in industrial, electric set and marine versions. Caterpillar also manufactures the lowest cost per horsepower natural gas engine on the market today. Hundreds of thousands of Cat Diesel predecessors to the new series have set performance and economy records, the world over.



## D333 . . . 270 HP
## (Shown as Marine Engine*)

*All available in industrial, electric set, or marine configurations. These are maximum usable horsepower ratings with 85° water to aftercooler.

**GOOD SERVICE LIFE** Valve rotators insure perfect valve seating, give extended valve life. Turbocharging helps keep valve temperature lower. Pistons are spray cooled from underneath and cylinder liners are full length, wet type for better heat transfer. These features and many others such as elliptically shaped pistons and shot peened, fatigue-resistant crankshafts make this series dependable performers.

**SMOOTH AND QUIET RUNNING** All of these engines are smooth running. The four-cylinder D320 and D330 have built-in balancers that remove the roughness characteristic in four-cylinder engines. Turbocharging muffles exhaust noises to a point where mechanical muffling or insulation is not often needed.

**ECONOMICAL** These engines have a precombustion chamber injection system design which is non-sensitive and lets the engine digest lower-cost, heavier, higher-heat-content fuel. Being able to burn fuel such as commonly available household furnace oil compared to gasoline or premium diesel can save many thousands of dollars in fuel costs over the life of the engine.

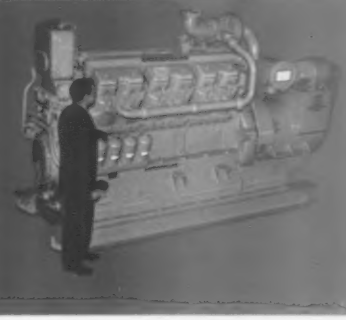
**DEPENDABLE** These engines can idle for extended periods, then accelerate to full load and speed with a clean, clear exhaust. This ability to burn fuel completely over a full range of speed and load is the result of four-cycle design plus the use of a precombustion chamber injection system. It results also in better part load fuel economy.

**POWERFUL** The specification sheet horsepower is the horsepower you can use. There is no need for derating with a Cat Diesel. In fact, you can request and get a formal horsepower certification with each engine you purchase.

D342 MARINE

G375 NATURAL GAS

D397 ELECTRIC SET



Completed in 1959, the new Mossville, Illinois, Industrial Engine Plant manufactures Cat Engines on a mass-production basis.

Partially complete, Caterpillar's new Technical Center provides an appropriate research atmosphere and ultra-modern facilities. Two of these buildings are devoted to prime power research.

Basic in-line Diesel and Natural Gas Engines are also machined and assembled in this modern Peoria, Illinois, plant, completed in 1948. Another large plant (San Leandro, Calif.) manufactures fuel injection components.

**FROM POWER CITY COMES MODERN DIESEL AND NATURAL GAS ENGINES PLUS DIESEL ELECTRIC SETS FOR EVERY POWER USE**

The present diesel and natural gas engine line, the facilities and the manpower are all dedicated to give you the best diesel engine value on the market today.

We offer this value in new engines and the constantly improved diesel industry standards such as the D397 and D342. This value results from assembly line, mass-production economies, precision manufacture, 100% inspection, excellent metallurgical quality, modern, compact design, more than thirty years of diesel experience and a constant intent to offer engines at an economical price per unit of horsepower.

Whatever your diesel or gas engine needs may be, you can expect Cat to offer the most for a reasonable price, low operating cost and a low final cost.

Specify Cat and be sure of satisfaction.

**CATERPILLAR**

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

**engine power**

**BY CATERPILLAR**

Printed in U.S.A.

*continued from page 40*

## Shelton, Spear and Goodner promoted by Dolese Bros.

TROY SHELTON, vice president, has been elected executive vice president of Dolese Bros. Co. and The Dolese Co., Oklahoma City, Okla. J. R. Spear, formerly assistant treasurer, has been named vice president, and Jeff G. Goodner, general sales manager, has been made director of public relations.

## W. O. Lawrence to direct Universal Atlas divisions

W. O. LAWRENCE, assistant vice president, Universal Atlas Cement Division, U. S. Steel Corp., has been appointed to direct and coordinate the following divisions: purchasing; raw materials and manufacturing research; quality and technical services; and research laboratories.

At the same time, Mr. Lawrence announced the appointments of Clayton L. Davis as director of the quality and technical services division, and Arthur Horen, director of raw materials and manufacturing research division.

Mr. Davis, a native of Michigan, is a civil engineering graduate of the University of Michigan. He served for several years with Huron Portland Cement Co. and in the physical testing of cement for Michigan State Highway Laboratories before joining Universal Atlas Cement Co. at Chicago in 1930 as engineer in the inspection bureau. Seven years later he became assistant engineer of tests. In 1943 he was appointed engineer of tests and in 1955 became technical service director.

Mr. Horen was graduated from College of the City of New York with a BS degree in geology and attended Harvard University where he received an AM degree and Ph.D. in economic geology. He joined U. S. Steel as geologist at Columbia Iron Mining Co. in 1953 and two years later was made project engineer-raw materials division. In 1957 he was appointed director-raw materials by Universal Atlas Cement Division, and became assistant director-research in 1958.

## Alpha promotes three to new departments

JAMES I. MAGUIRE, purchasing agent, has been promoted to director of management services, Alpha Portland Cement Co., Easton, Pa. Victor W. Anckaitis, formerly construction engineer, has been appointed director of property management, and Robert E. Hartmann, assistant to the treasurer, has been named controller.

Mr. Maguire started with Alpha in the purchasing department in 1949, became eastern division purchasing agent in 1952 and purchasing agent in 1958.

Mr. Anckaitis joined Alpha in 1951 as a construction engineer. He has a BS degree in civil engineering from Lafayette College, Easton.

Mr. Hartmann, a graduate of Miami University, Oxford, Ohio, had been assistant to the treasurer since he joined the company in 1958.

## Hawaiian Cement names N. R. Potter sales manager

NATHANIEL R. POTTER, JR., has been appointed sales manager of Hawaiian Cement Corp., Honolulu, Hawaii. A native of Rochester, N.Y., Mr. Potter is a graduate of Amherst College and member of the American Concrete Institute. A resident of Honolulu for the past 10 years, Mr. Potter was formerly in the sales department of Grace Bros. Ltd.

Officers re-elected are Robert D. Fisher, president; Howard R. Starke, executive vice president and general manager; and Ralph Yeaman, secretary-treasurer.

Directors re-elected are Garner A. Beckett, chairman of the board, and Henry T. Mudd, Allen L. Chickering, Alfred R. Thomas, Lowell S. Dillingham, C. C. Cadagan, L. E. Bingham, Hung Wo Ching and C. W. Carlsmith.

## Henry Long appointed MICA general manager

HENRY J. LONG has been appointed general manager of the MICA mine and milling facilities at Cordova, N.M., of the Clute Corp., Los Angeles, Calif. Under a management contract agreement with MICA (Mineral Industrial Commodities of America), the Clute Corp. is developing production of mica products from the 350-acre mining claim. Mr. Long will supervise operations of the mill at Cordova and the fine grinding plant near Pojaque, New Mexico.

Mr. Long is a native of Durango, Colo., and received his education in mining engineering at Denver University and the Colorado School of Mines. He has had 20 years' experience in mining and mineral processing, 13 years having been spent in the mica industry. He managed the development and construction of the grinding plant for Western Mica Co. at Fort Worth, Texas.

## Bessemer Limestone elects directors

HARRY E. REED, vice president in charge of operations, and A. E. Harpold, vice president in charge of sales, The Bessemer Limestone & Cement Co., Marion, Ohio, have been elected directors of the company. Re-elected directors are A. E. Adams, Jr.; J. Q. Adams; L. A. Beeghly; W. E. Bliss; David E. Jones; R. E. Roscoe; R. C. Steese; Fred Tod, Jr., and Frank B. Warren. S. Livingston Mather resigned as a director for reasons of health.

## Peerless Cement appoints public relations director

CARL M. KRUEGER has been named director of public relations for Peerless Cement Co., Detroit, Mich. He was formerly vice president and general manager of Julius Porath & Son Co. of Detroit. A past president of the Michigan Road Builders Association, Mr. Krueger received a degree in civil engineering from the University of Michigan.

## Research vice president named by N. Y. Trap Rock

MILTON E. GOUL, former district engineer of the New York State Department of Public Works, has been appointed vice president of research and marketing for New York Trap Rock Corp., West Nyack, N.Y.

## Manager of purchases

D. E. SODOMA, purchasing agent, has been appointed manager of purchases for California Portland Cement Co., Los Angeles, Calif., and its subsidiary, Arizona Portland Cement Co.

END

# UNION

## The High I. Q.* Wire Rope Organization

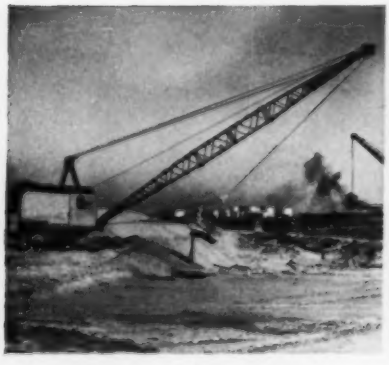
**Integrity — Quality*

More and more purchasing agents are employing a new concept in buying called value analysis. In it the integrity of the seller weighs heavily since it assures maintenance of uniformly high product quality.

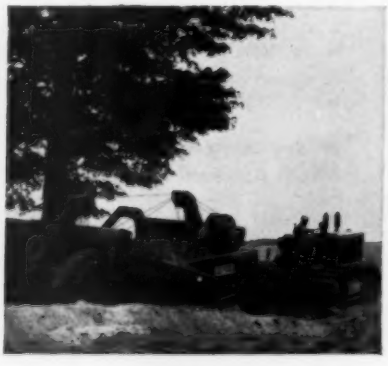
Advanced procedures and equipment in Union's foremost laboratory enable our technicians to determine the life expectancy of wire ropes. Much of the time of our engineers is spent in the field checking to see that Union wire ropes live up to or exceed predetermined life expectancy rating under varying operating conditions.

In living with wire ropes and slings from the cradle to the grave, our engineers found new constructions were necessary. On many of the tougher jobs the life expectancy of standard wire ropes of the highest quality was too short. To equip the machines handling these tough jobs with the ultimate low cost wire rope and slings, Union developed the Tuffy family. Each member is a special construction tailored to fit a special purpose. For many years Tuffy's ultimate low cost wire ropes and slings have helped battle the rising cost of operation.

## Tuffy Wire Ropes and Slings Are Tailored For Tough Jobs

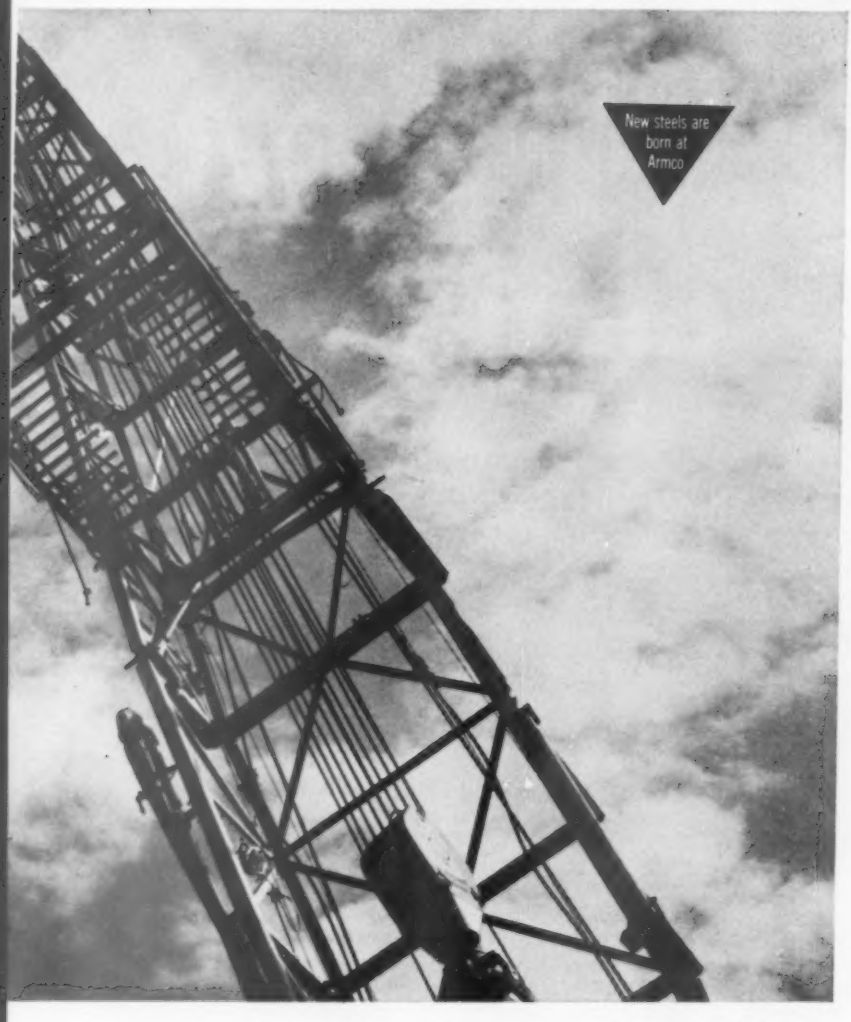


**Tuffy Balanced Dragline Rope**



**Tuffy Balanced Scraper Rope**

**Tuffy Balanced Dozer Rope**




Wire ropes travel hundreds of ton-miles on rotary oil drilling rigs lifting and lowering drill pipe and tools out of and into the hole. On the world's deepest oil well Tuffy Rotary Line handled the longest string of well casing ever run. The final live load totaled 700,000 lbs.

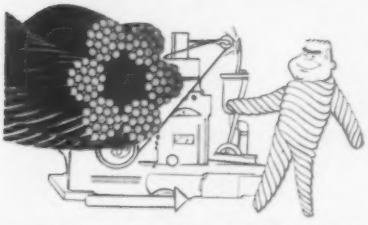
## Union Distributors Are Selected On High I. Q. Standards

They know from experience that they can serve you with quality backed by integrity and enjoy a high expectancy for your repeat business. Look up your Union Wire Rope distributor in the yellow pages of your phone book. He is coached in helping you before and after the sale. Backing him up is an expert staff at a nearby Union Wire Rope branch office and warehouse.

## Tuffy Wire Rope Tips

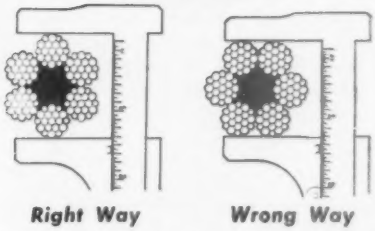
**Money-Saving Information on the Use and Care of Wire Rope**

### Wire Rope is a "Machine" of Moving Parts



...and every part must fight destructive forces! A "look inside" a section of wire rope reveals a precision assembly of working parts. They are subjected not only to external and internal stresses, but also to heavy surface pressures and abrading. All these forces may be sustained while the rope is running at high speeds, and abruptly changing direction. That's why different uses require different constructions of wire rope.

### How to Measure Rope Diameter



*Right Way* *Wrong Way*

There's only one right way: Use machinist's calipers, and be sure to measure the widest diameter. A slight shift of the rope in the calipers (shown at right above) might cause ordering an undersize rope.

### How to Measure Tread Diameter

Easy, and important. Select the smallest sheave or drum to be used with the new wire rope, and measure actual diameter at lateral center (shortest dimension) of tread.

**Would you like a copy of a booklet in which more than a score of Tuffy Tips like these above are reproduced. If so, write Union Wire Rope Corporation, 2156 Manchester Ave., Kansas City 26, Missouri.**

**Tuffy Balanced Slings and Hoist Lines**

**UNION** Wire Rope

*Subsidiary of* ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Southwest Steel Products

3-C

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# INDUSTRY NEWS

## Ideal commissions ship; announces eastern plant

IN THE NEWS TWICE in recent weeks, Ideal Cement Co., Denver, Colo., commissioned the SS Keva Ideal, "largest cement carrier afloat under the American flag," and announced plans to build a new 1.5-million-bbl. plant in Wilmington, N.C.

The Keva Ideal can carry 80,000 bbl. of bulk cement. She was commissioned by Miss Felicity Ann Dobbins, daughter of Ideal's president, Cris Dobbins. The commissioning was the latest step in Ideal's use of water transportation for its business. The ship gives the company great flexibility in serving its customers in the Gulf South and on the West Coast.

Besides cement, the ship can carry 13,000 tons of gypsum or limestone. Loading and unloading are automatic.

The new Ideal plant at Wilmington will be its first on the Eastern Seaboard, as well as the first cement plant in the state of North Carolina. A distribution plant will be erected at Fayetteville. An estimated $16 million will be spent on the new 1½-million bbl. facility by the company which already has 17 plants and five terminals from the Pacific Northwest to eastern Tennessee and the Gulf.

## AIME schedules symposium on agglomeration for 1961

AMERICAN INSTITUTE of Mining, Metallurgical, and Petroleum Engineers announces plans for the first American-held international symposium on agglomeration, to be held at the Sheraton Hotel, Philadelphia, Pa., April 12-14, 1961. Engineers, scientists, industrialists and educators from many countries are expected to attend. The underlying theme will be the basic mechanisms common to agglomeration processes in general.

Specifically, the symposium will deal with the processes of sintering, pelletizing, nodulizing, briquetting, powder metallurgy, ceramic bonding and related processes. Ferrous and nonferrous ores, carbonaceous materials, ceramics and other nonmetallics will be included.

The program will emphasize fundamental aspects of agglomeration. Descriptions of existing plants will be limited to examples and proof of application. It will begin with characterization of raw materials to be agglomerated and preparation of charge, progressing through consideration of various agglomerating processes to a discussion of the evaluation and utilization of agglomerating products.

## Texas Gulf to develop Utah potash properties

TEXAS GULF SULPHUR CO., Houston, Texas, will acquire and commercially develop the potash properties in Utah of Delhi-Taylor Oil Corp. Exploration work has been carried on since 1953 by Delhi-Taylor, establishing two large potash reserve areas near Moab.

"In particular, the Cane Creek Anticline area indicates a long-term, high-grade potash reserve that promises to become a new and major domestic source of this vital material," said the announcement.

Commercial development is expected to begin after Texas Gulf completes an examination of the technical aspects of the project. It has until January 1, 1961 to do this.

A statement by Dr. C. F. Fogarty, vice president and manager of exploration for Texas Gulf, was quoted by the Wall Street Journal. If everything goes according to schedule, he said, the company will go into potash production in about 2½ years.

Delhi-Taylor will retain a 25-percent net profits interest in the properties under development.

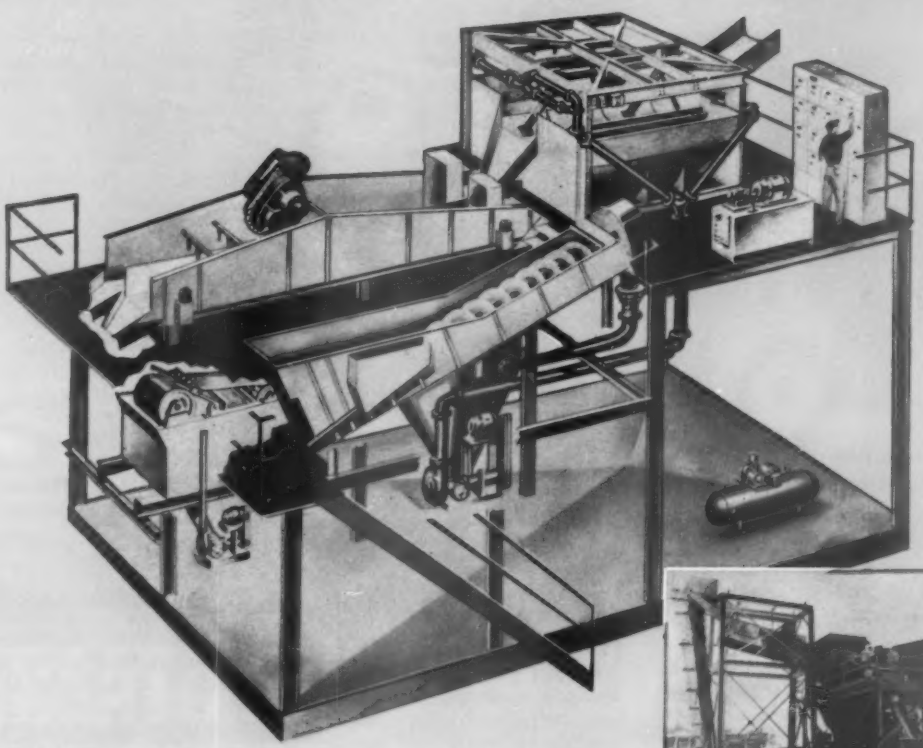
## Pavement yardage

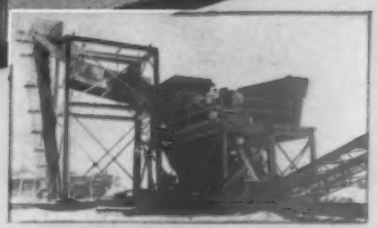
AWARDS OF CONCRETE PAVEMENT for April and the first 4 months of 1960 have been classified by Portland Cement Association as follows:

| | Sq. yd. awarded during: April | 1st 4 mos. |
|---|---|---|
| Roads | 5,482,072 | 19,909,264 |
| Streets and alleys | 2,589,377 | 7,652,273 |
| Airports | 334,604 | 2,041,790 |
| Totals | 8,406,053 | 29,603,327 |

*(Continued on page 50)*

# A NEW HIGH DEGREE OF DELETERIOUS MATERIAL REMOVED BY EAGLE HMS PLANTS!





Eagle HMS Plants handle crushed stone as well as gravel—this unit is doing excellent job removing chert and porous limestone.

**A** STUDY of Eagle Heavy Media Separation Plants in use shows that they are providing remarkable separation of unwanted material of lighter specific gravity, retaining a higher percentage of sound usable stone.

*THE secret is in the O.C.C. Separatory vessel, at top right in the drawing.* The wanted material sinks to the rounded bottom of the vessel. A rubber-bladed hydraulic raking mechanism lifts the sink material over both sides into flumes to the rinsing screen. The lighter stone or gravel is held in suspension by the media until it is floated out onto a separate rinsing screen where the media is washed off and recovered for re-use. *Deleterious float material cannot recontaminate the sink material in this HMS plant, once the two are separated.*

Operation is surprisingly simple and economical. Plant capacities 25-tons and larger. If you have chert or soft stone problems *send for Eagle HMS data file.*

This Michigan producer readily meets premium material specs since installing an Eagle HMS Plant to handle natural gravel. Float material runs 9-10%.

Eagle HMS Plant solved chert and soft stone problem in crushed gravel for this aggregate plant thus gaining new customers.

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***Factory-Trained Distributors Everywhere.***

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## Inspect Dundee plant prior to dedication

DR. HANS A. GYGI (left), president of the new Dundee Cement Co., Dundee, Mich., and Roblee B. Martin, vice president and general manager, inspect the $25-million, 6-million-bbl. plant just before formal dedication ceremonies June 2.

Guests at the dedication toured the plant and attended a reception. They included representatives of government and industry from Michigan, Indiana, Illinois and Ohio, the four states comprising the market area of the new company. In addition, guests from the cement industry studied the plant layout and operations, observing Dundee's construction reported (See ROCK PRODUCTS, May 1960, p. 98) to have cost slightly less than $5 per bbl. of annual capacity, as against the customary $10 to $14.

Principal speaker at the ceremony was Walker L. Cisler, president of The Detroit Edison Co., whose Enrico Fermi Atomic Power Plant at Monroe, Mich., is an industrial neighbor of the new cement company.

## 1959 safety winners

THE NATIONAL LIMESTONE ASSOCIATION reports that the year of 1959 shows an all time record with 22 plants receiving awards for no lost-time accidents. This figure tops the previous mark of 17 made in 1956. The following are the winners of the 1959 safety awards, who will receive NLA Certificates of Achievement in Safety at the fall operating meeting in Chicago.

Class A-1—*Quarries with calcining plants working 100,000 man-hours or more*: U. S. Gypsum Co., Genoa, Ohio, 445,387 hr.; Standard Lime & Cement Co., Woodville, Ohio, 349,-434 hr.; G. & W. H. Corson, Inc., Plymouth Meeting, Pa., 346,569 hr.; U. S. Gypsum Co., New Braunfels, Texas, 256,361 hr.; Ash Grove Lime & Portland Cement Co., Galloway, Mo., 245,003 hr.; Kaiser Aluminum & Chemical Corp., Moss Landing, Calif., 237,866 hr.; Standard Lime & Cement Co., Knoxville, Tenn., 117,-785 hr. and National Gypsum Co., York, Pa., 104,244 hr.

Class A-2—*Quarries with calcining plants working less than 100,000 man-hours*: Diamond Springs Lime Co., El Dorado, Calif., 96,066 hr.; Marblehead Lime Co., Grantsville, Utah, 78,-793 hr.; Jones & Laughlin Steel Corp. Blair Limestone Div., Harpers Ferry, W. Va., 66,051 hr. and Rockwell Lime Co., Manitowoc, Wisconsin, 14,411 hr.

Class B—*Underground mines with calcining plants*: National Gypsum Co., Bellefonte, Pa., 359,428 hr.; Standard Lime & Cement Co., Pleasant Gap, Pa., 223,646 hr.; Standard Lime & Cement Co., Kimballton, Va., 190,008 hr.; Marblehead Lime Co., Hannibal, Mo., 125,252 hr. and Marblehead Lime Co., Quincy, Ill., 55,652 hr.

Class C—*Calcining plants only*: Marblehead Lime Co., Thornton, Ill., 160,798 hr.; Marblehead Lime Co., Chicago, Ill., 117,124 hr.; The Dow Chemical Co., Ludington, Mich., 86,-467 hr.; Ash Grove Lime & Portland Cement Co., Springfield, Mo., 73,166 hr.; U. S. Gypsum Co., Farnams, Mass., 67,612 hr. and Kelley Island New York Corp., Buffalo, N.Y., 49,-425 hr.

### What's Coming

THE August issue of ROCK PRODUCTS will feature several producers who are reaching out into new markets for their products with strategically placed new plants. These will include:

- Southwestern Portland Cement Co.'s 1¼-million bbl. plant at Odessa that now serves the oil-rich Permian Basin in west Texas. It was built at great speed, yet it was carefully designed to be expanded quickly and easily to meet an anticipated demand for cement.
- One of the southernmost outcrops of granite on Georgia is worked by Tyrone Rock Products. Its hard, dense granite products are shipped by rail into the booming markets for aggregates in Florida and southern Georgia.

Labor relations problems stay in the forefront of interest to rock products producers. The August issue will have a story about how Connecticut ready mix producers banded together to solve some of their thorny negotiating problems. Their experiences offer some challenging ideas to all producers in our industry who are faced with the same situations.

## Portland cement production

PRODUCTION of finished portland cement in March 1960 was reported by the U. S. Bureau of Mines as totaling 18.4 million bbl., a decrease of 24 percent compared with March 1959. Mill shipments were 17.7 million bbl., down 23 percent. Stocks of finished portland cement on hand March 31, totaling 39 million bbl., were 8 percent higher than the year-earlier figure. Clinker production for the month, at 24.5 million bbl., was down 9 percent from the March 1959 amount. The figures were provided by 161 plants in 37 states and Puerto Rico.

## Clute concludes survey of asbestos reserves

CLUTE CORP. has established the largest reserves of asbestos ore in the United States, says its president, John H. Lowell. He said that a geological survey at its ABC mine near Napa, Calif., disclosed 4 million tons of proved asbestos ore, 7 million tons probable and 200 million tons possible. This more than doubles the reserves established on the property six months before. Construction of a 1,000-tpd. mill is in progress at the mine site, with first major production of asbestos fiber expected in August.

*(Continued on page 52)*

# VERSATILE CAT DW20-SCRAPER MAKES SHORT WORK OF EVERY JOB

Cat DW20G-456B dumps onto a conveyor at Rhodes and Jamieson's Fremont plant.

Big loads to the crusher; high-speed hauling; and fast, low-cost stripping with the same machine slash costs for sand and gravel plants. This is the all-job performance Rhodes and Jamieson, Ltd., of Fremont, Calif., expect and get from their five Caterpillar DW20-456 Tractor-Scrapers.

At Fremont, three DW20s, pushloaded by a Cat D9 Tractor, speed sand and gravel 2,000 yards to the washing and screening plant. At nearby Pleasanton, two DW20s, also pushloaded by a D9, easily supply material on a ¼-mile haul. The same scraper fleets also strip overburden to further reduce costs.

Cat-built equipment has been first choice for Rhodes and Jamieson since the Fremont plant opened in 1951. The high-production, low-cost DW20G-456B handles the toughest loading and hauling jobs. The DW20G's 345 HP (max. output) turbocharged Cat Diesel Engine provides travel speeds to 35.8 MPH. Its 456B LOWBOWL Scraper carries 19.5 cu. yd. struck, 27 cu. yd. heaped. Optional SynchroTouch Transmission Control lets the operator simply dial the desired gear for automatic, split-second shifting.

Find out how you can cut your equipment and production costs with this all-purpose earthmover. Call your Caterpillar Dealer.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

**CATERPILLAR**

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HIGH PRODUCTION AT LOW COST— THE DW20-456 TEAM

*continued from page 50*

## Cover Story

THE CHIPS WERE DOWN at Springfield Sand & Gravel Co. It was a difficult choice to make—redesign and rebuild the plant to meet specifications of the market, or face a drawn-out decline before going out of business. Its progressive owners took the plunge and built a new plant. Now they can control sand gradation to meet close specifications. The story of how they did it starts on page 90.

## Chamber of Commerce digests labor cases

HIGHLIGHTS of the Labor Case Digest, May 1960 (published by the Labor Relations and Legal Department of the U. S. Chamber of Commerce) include the following:

- The District of Columbia Court of Appeals upheld the NLRB in its policy that reserved-gate picketing is an illegal secondary boycott. The first court test of the policy involved electrical union workers who picketed at a gate reserved for outside contractors at the General Electric plant in Louisville, Ky.
- Activity of supervisors in union affairs is illegal, ruled the NLRB. An order was issued against an association of bricklayers' employers and its members who participated in election of officers of a Bricklayers Union local in Philadelphia.
- First rulings on Landrum-Griffin "hot cargo" provisions have been issued by NLRB's general counsel. A complaint was issued against a company and union which returned plumbing fixtures and substituted others from a company whose employes were represented by the union.
- In the first test of the Landrum-Griffin provision for expedited representation elections, a U. S. District Court in San Francisco denied a union motion to enjoin the NLRB from conducting the election.
- A U. S. District Court forbade use of a local Teamster Union's money to aid officers of the union in their defense against criminal and civil court proceedings. Even though a majority of the union approved this use of the money, the court found that expenditures are permitted only when made in accordance with lawful union bylaws. This was one of the first tests of the fiduciary responsibility provision of the Landrum-Griffin Act.

## AIEE conference centers on cement

ONE OF THE RARE opportunities for the operating personnel of cement producers to meet informally with equipment suppliers is provided by the annual meeting of the Cement Industry Subcommittee of the American Institute of Electrical Engineers. Held this year in Milwaukee, it featured an interchange of manufacturer know-how with the practical experience of plant operators.

Recognizing that electrical engineers have other than strictly technical problems, the committee scheduled papers on plant safety and machinery drives as well as power distribution and process control by instrumentation and automation.

Computer operation of cement plants and X-ray analysis for process control shared the spotlight at one session. LeRoy W. Weeks and R. L. Boulden of American Cement Corp. reported on the operation of the computer setup at Riverside Cement Div. (see ROCK PRODUCTS, April 1960, p. 85, for an article by Mr. Weeks.)

A panel of three investigated the use of the X-ray emission gauge for analyzing the chemical elements in dry powder samples. They included B. E. Kester, Missouri Portland Cement Co., G. B. Moore, Southwestern Portland Cement Co., and W. F. Loranger, General Electric Co. They advised the instrument must meet three conditions before it can be used successfully:

(1) Its use must have unqualified management support, including an understanding of its shortcomings as well as its undisputed advantages for process control. (2) Technically trained, competent operators must be assigned to the machine. (3) The results obtained are no better than the correctness of the analysis of the reference sample; therefore a library of standard samples should be built up. Regular reference should be made to a standard, and corrections should be made in the procedure if proved necessary.

As these newer methods for process control come into wider use, more attention must be paid to the techniques for obtaining a completely reliable and representative sample of material in process. Automatic sampling machines were reviewed by R. J. Jager of Lone Star Cement Co. and J. A. Mitchell of the Portland Cement Association.

Next year's meeting will be held at the Sheraton-Cadillac Hotel, Detroit, Mich., in May. Newly elected chairman of the executive committee is John F. Hower, chief electrical engineer of Lehigh Portland Cement Co. Mr. Hower succeeds Walter A. Allen, Universal Atlas Cement Corp., outgoing chairman.

## U. S. Gypsum plans Baltimore plant

UNITED STATES GYPSUM CO. plans to build a new gypsum plant at Baltimore, Md. Options have been taken to purchase a plant site on Marley Neck adjacent to the U. S. Quarantine Station on Quarantine Road. Construction would start early in 1961, with completion scheduled for early 1962.

"This will be our seventh gypsum plant on the Eastern Seaboard, and will serve the expanding Baltimore-Washington market area," said C. H. Shaver, chairman of the board, in announcing plans for the new plant. Gypsum rock for the plant will be supplied from deposits in Nova Scotia by company-owned ships.

## Superior Stone has new crushing plant

SUPERIOR STONE CO., Raleigh, N.C., a division of American-Marietta Co., opened a new crushing plant at its quarry at New Bern, N.C. The plant can ship by truck, rail or barge thanks to a new canal that gives the plant access to the Neuse River.

*(Continued on page 56)*

# Get the *True* Facts of Life!

(TRUCK LIFE, THAT IS)

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More than
2 Million Eaton Axles
in Trucks Today

**Your truck dealer will tell you how Eaton 2-Speed Axles can extend the life of your trucks by thousands of trouble-free, low-cost miles.**

**By reducing engine rpm in relation to vehicle speeds, Eaton 2-Speed Axles hold down wear on engines and all power transmitting units. They add to miles travelled and number of loads carried between engine overhauls; they reduce maintenance costs; keep trucks on the road, out of the shop. Your dealer will also tell you that trucks equipped with Eaton 2-Speed Axles bring higher allowances when traded in.**

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*More proof that...*

**AMSCO HELPS YOU MOVE MORE TONS PER DOLLAR**

*How a large contractor and a crusher manufacturer have cut downtime and increased service life with AMSCO equipment*

AT MT. VERNON CONTRACTING CORP.

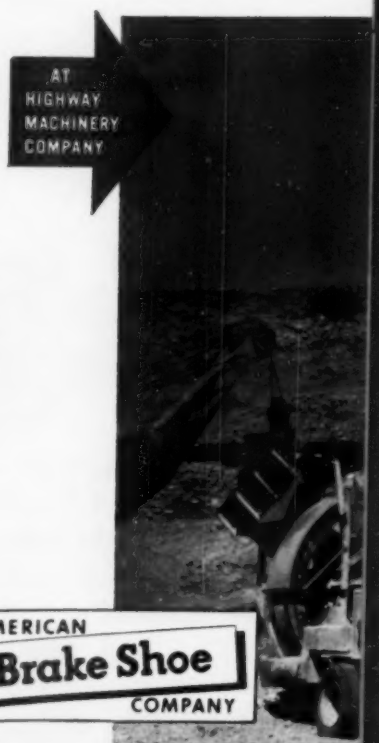
## DAILY "TOOTH REPAIR" ELIMINATED BY SWITCHING TO AMSCO 2-PART TEETH

Mount Vernon Contracting Corp. is a large general contractor doing work throughout the middle Atlantic states. Its present contract is for road construction on the Cross Westchester Expressway, linking the New York State and New England Thruways.

The firm's four power shovels and two backhoes on this job are equipped with Amsco dippers or dipper parts and Amsco Simplex* 2-Part Teeth. Reason: competitive teeth previously used required daily welding build-up to maintain their points. Now, since switching to the Amsco Simplex, teeth are changed only about once a week. And change-over is *only a 5-minute job!*

With shovels operating 8 hours a day, 5 days a week, this is a mighty important advantage for Mt. Vernon. No wonder they say—"These Simplex teeth really stand up in service, especially in rock, and save us a lot of downtime."

*Patent No. 2,904,908



AT HIGHWAY MACHINERY COMPANY

## AMSCO CRUSHER ROLLS HANDLE 50,000 YDS. BETWEEN BUILD-UPS

Carroll Hicken (left) owner of Highway Machinery Company, Waukesha, Wisconsin, is a long-time user of Amsco equipment. His firm designs and manufactures self-propelled machines for crushing road material, both gravel and stone. All of their machines are rented out or sold to contractors, with maintenance and service handled by Highway Machinery.

For years, the company has used Amsco Manganese Steel Crusher Rolls exclusively. Amsco Manganese welding rods and bars are also used for build-up. On a typical rental machine, pictured at right, the Amsco rolls had *crushed over 50,000 yds. since their last build-up* six months before.

Mr. Hicken says that with Amsco Manganese rods he can multiply the life of a roll by 5 to 10 times. He adds—"They have proven very fine, and we're getting more yardage than with any rods we formerly used."

# AMSCO

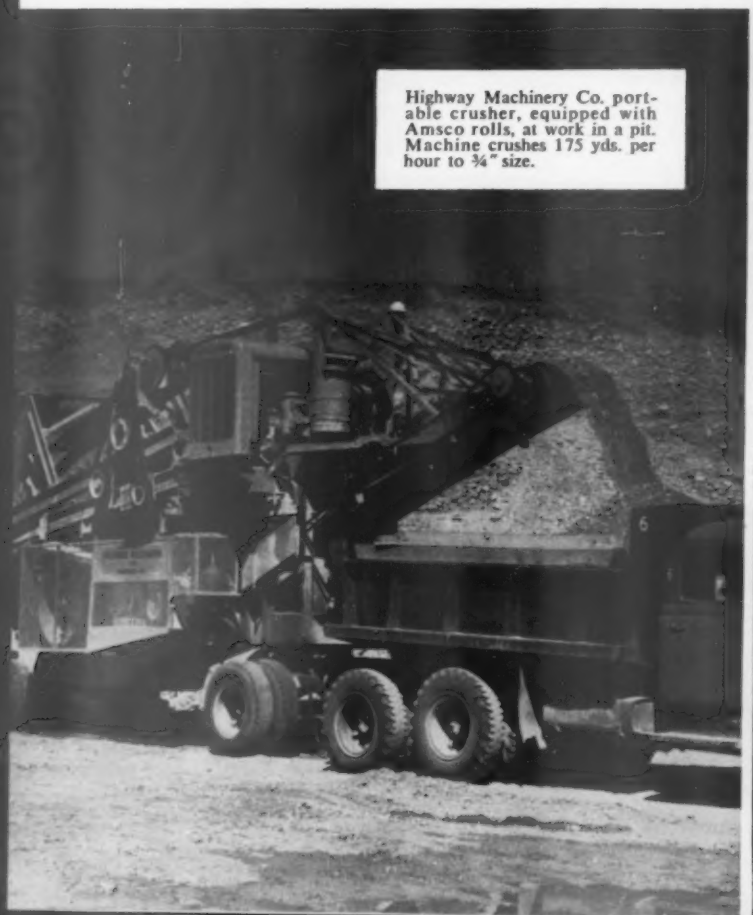
**American Manganese Steel Division • Chicago Heights, Ill.**

Other plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions
Welding products distributed by Canadian Liquid Air Co., Ltd.

AMERICAN Brake Shoe COMPANY

Northwest shovel, equipped with Amsco Dipper and Simplex 2-Part Teeth, at work on Cross Westchester Expressway project.

Shovel operator, Walter Reich, inspecting Amsco Simplex 2-Part Teeth used on Mt. Vernon Contracting Corp. shovel.



Highway Machinery Co. portable crusher, equipped with Amsco rolls, at work in a pit. Machine crushes 175 yds. per hour to ¾" size.

Amsco 25 x 24 manganese steel crusher rolls, of type used in portable crusher at left.

Welder demonstrating how Amsco Manganese rods are used for build-up on rolls.

HERE WE GO!
WAGON TRAIN
MORE TONS PER TRIP
A CONVENIENT WAY TO
UNLOAD — SIDE DELIVERY —
KEEP GOING. LEAVE
ROAD CLEAR FOR NEXT
WAGON TRAIN

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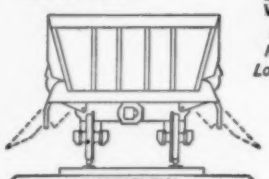
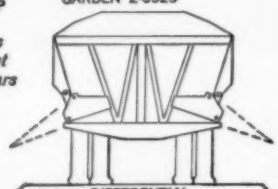


DIFFERENTIAL RAIL TRAIN

PATENTED



DIFFERENTIAL WAGON TRAIN

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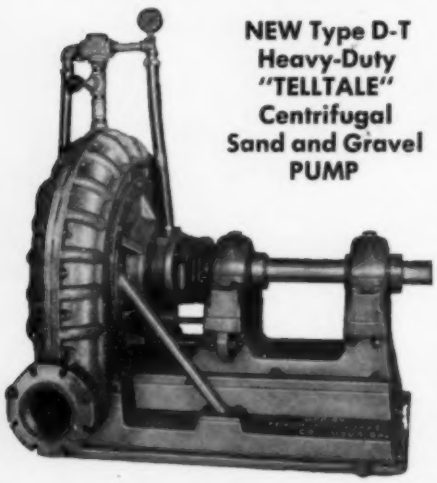
**WHY "TELLTALE" PUMP USERS HAVE PRIORITY ON PARTS**



**NEW Type D-T Heavy-Duty "TELLTALE" Centrifugal Sand and Gravel PUMP**

In a showdown, the already "Telltale" owner's order gets priority over an order for a new pump. That's a firm "Telltale" policy—insurance against downtime along with lower parts-changing time, higher production, longer wear—minimum cost of production per yard.

**AS LOW IN DOWNTIME AS IT IS HIGH IN PRODUCTION**

"Telltale" is the only pump that warns when it's time to reline. Air sucked through periphery ports causes pump to lose its prime. Pumping stops. Water leaking through the ports signals that the shell liner and the surrounding belt of packing have worn through.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy-Duty folder and prices.

**PEKOR IRON WORKS, INC.**

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*(Continued from page 52)*

## Safety Council award

"FOR EXCEPTIONAL SERVICE to safety" reads the plaque handed to Philip D. Allen, publisher of ROCK PRODUCTS. The award was presented by J. Christie of National Safety Council.

## Construction begun by Big Horn Gypsum

THE $3-MILLION gypsum board plant at Cody, Wyo., of Big Horn Gypsum Co. will be in operation by January 1961, said Sid H. Eliason, Salt Lake City, president. Engineering is complete and machinery on order, he said; construction was begun in May.

The company is acquiring the high-grade gypsum deposit at Cody from the Taggart family. Comprising 41 million tons, it is described as the largest untapped source of calcium sulfate in the West. Mining will be by open-pit methods. Annual production at the wallboard plant will be 100 million board feet.

Mr. Eliason was instrumental in founding Western Gypsum Co., Sigurd, Utah, which he and his associates sold to Certain-Teed Products, now Bestwall Gypsum.

## Inland Lime & Stone's new sinter plant ready

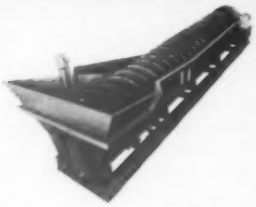
THE NEW SINTER SAND PLANT of Inland Lime & Stone Co. at Port Inland, Mich., has been reported ready for operation. The plant will produce a new type of fluxing limestone. New in steel making, the use of sinter sand derived from limestone represents a process which increases daily output of steel and aids in making steel from finely ground, low-grade ores.

*(Continued on page 58)*

# WEMCO

# COMPLETE EQUIPMENT FOR AGGREGATE TREATMENT

## SAND PREPARATION



WEMCO

*SAND-PREPARATION MACHINE*

Used wherever sand must be produced to specifications. Spiral with 75% pitch provides greater sand raking capacity . . . retention of fine sands with sharper separation . . . less maintenance.

WEMCO

*SAND-CLONE*

Recovers and sizes sands in the finer fractions from dilute slurries. Supplements Wemco Sand Prep for special conditions or requirements.

WEMCO

*SAND-SORT*

Free-settling classifying tank for separating sands into desired grades and sizes, removing large volumes of excess water, blending sand to varied specifications, with new automatic controls. Features individually controllable valve discharge . . . automatic valve closure in case of power failure or shutdown . . .

WEMCO

*SAND-SIZER*

Accurate sizing of sand into multiple fractions, and blending, for specification sand. Simple operation with maximum flexibility and control of each cell or compartment.

WEMCO

*SAND-SCRUBBER*

For economical scouring of sands, scrubbing off of coatings, breaking up of conglomerants. Opposed propeller blade action produces maximum scrubbing action with minimum contact time.

## AGGREGATE BENEFICIATION

WEMCO

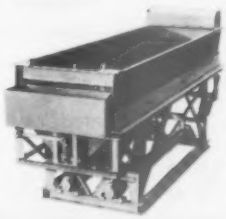
*HMS MOBIL-MILL*

The only proved "packaged" HMS plant, pre-engineered, ready for set-up and operation. Removes wide range of deleterious material, produces large volume specification aggregate at low cost, minimum labor.

WEMCO

*REMER JIG*

For cleaning large tonnages of sand and gravel, production of specification aggregate . . . removes lightweight deleterious materials. Differential acceleration with long, wide bed gives faster, more active segregation over larger area.

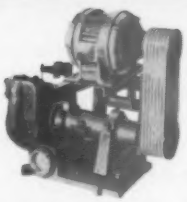


## PUMPING—SAND and GRAVEL

WEMCO

*SAND PUMP (HORIZONTAL)*

Universally in use for transfer of slurries containing sands and abrasive solids, screen products and grinding mill discharge to washers, scrubbers, sizers, or sand preparation machines. Simple operation. Minimum wear and labor requirements.



WEMCO

*SAND PUMP (VERTICAL)*

Performance of horizontal Sand Pump with added vertical features. Widely used for clean-up duty installed over sump without need for separate pump pit.

WEMCO

*TORQUE-FLOW PUMP*

Unique Torque-Flow principle, open impeller, allows pumping of anything in a slurry which will enter throat. Handles solids with little wear at steady discharge pressures. Clogging by solids is eliminated.

WEMCO®

*a division of*

**Western Machinery Company**

650 Fifth Street, San Francisco 7, California

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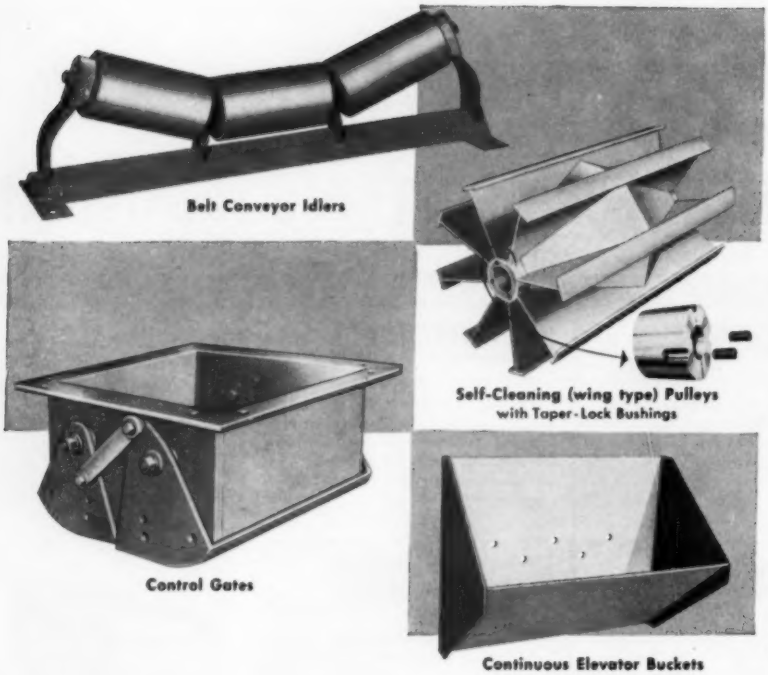


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**HELP INCREASE PRODUCTION AND LOWER YOUR COSTS**

MARCO specializes in designing and manufacturing a complete line of modern accessories used in materials handling. The creative and sound engineering principles incorporated in MARCO equipment can help you gain greater efficiency of operation.

**Belt Conveyor Idlers:** MARCO equips each idler with precision ground ball bearings designed specifically to give greater load capacity, added years of idler service life and lower power requirements. Proof! At 300 revolutions per minute these anti-friction bearings will carry loads up to 860 lbs. per bearing.

Each bearing is pre-lubricated at the factory, then effectively sealed to eliminate field lubrication and reduce your maintenance costs.

Idlers fit any conveyor frame and are available in many types and sizes.

**Conveyor and Elevator Pulleys:** MARCO self-cleaning and solid steel pulleys offer outstanding advantages of machined faces and Taper-Lock bushings at a competitive price. Machined faces insure against pulleys being 'out-of-round', thereby increasing service-life of belt and pulleys. Taper-Lock bushings save time and trouble when mounting or demounting pulley. The MARCO line of pulleys is complete ...and delivery is prompt.

**Control Gates:** MARCO gates are engineered for easy installation and fast, smooth operation. Gates are operated by a positive linkage, instead of outmoded gears that wear out or become mis-aligned. Made of all steel construction and oversize wearing parts, these gates deliver maximum service under severe operating conditions. Available in 4 types and many sizes.

**Continuous Elevator Buckets:** Designed of two-piece construction and dieformed to insure uniformity. Continuous welds prevent leakage and give buckets added strength. Can be furnished with holes punched to standard punching diagrams or to suit your existing bolt patterns. MARCO makes the size and type elevator bucket to meet your exact requirements.

Compare and you'll see why materials handling accessories engineered by MARCO offer you more for your dollar. Get the complete facts from your MARCO distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Mo.

MARCO®

**engineered MARCO products:**

**Tubular Frame Belt Conveyors—Conveyor Idlers—Solid Steel and Self-Cleaning Steel Pulleys—Bucket Elevators—Control Gates—Feeders—Bins.**

*Enter 1452 on Reader Card*


## INDUSTRY NEWS

*(Continued from page 56)*

### Vermiculite insulation tests at Penn State

VERMICULITE AS AN insulation material for concrete block walls was tested by Pennsylvania State University, and results reported by L. J. Lambert at the recent meeting of Vermiculite Institute of Chicago. Mr. Lambert is chairman of the Institute's insulation committee.

Tests were conducted on 6, 8 and 12-in. block walls, with cores fi led with water-repellent vermiculite. Mr. Lambert said that results have been tabulated on the 8 and 12-in. block, and were to be available shortly on the 6-in. block. While insulating the cores increases the inside surface temperature of the entire wall, he said the fact that the tests show that no cold spots occur opposite the webs of the block is of much greater importance.

Vermiculite Institute of Chicago has a new president, L. G. McDiarmid of Vancouver, B.C.

### Texans talk over industry problems

TEXAS AGGREGATES ASSOCIATION devoted a productive session at its annual meeting to airing of industry problems. An able group of panelists, with E. Phil Gemmer of Texas Construction Material Co. as moderator, had their say in four vital areas of discussion: governmental affairs, legal and related problems, equipment problems and safety measures.

Taking those subjects, in the order mentioned, were Harold M. Lacy, Gifford-Hill & Co., Inc., Dallas; Noble W. Prentice, Janes-Prentice, Inc., Austin; Jack D. Foley, Wichita Sand & Gravel Co., Wichita Falls, and Glenn E. Pike, Wesco Materials Corp., Dallas.

The association has a new president, Robert G. Pyle, who moves up from the vice president's post to succeed L. Ed Lee.

### Kaiser buys Houston property for plant

KAISER GYPSUM CO. purchased 25 acres of waterfront property in Houston, Texas, on which it will build a gypsum products plant. Cost of the proposed new plant has been reported at $3 to $5 million.

*(Continued on page 62)*



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## SPECIAL REPORT TO CATERPILLAR OWNERS:

CAT CATERPILLAR

Parts you can trust
...cost less per hour

# Converting to Lifetime Lubricated Track Rollers costs less than you think

**Lifetime Lubricated Roller Groups,** including seals, shafts and end collars, *cost only a little more* than ordinary Bellows Seal Rollers without end collars. But this small expense of *initial* installation rapidly disappears through noticeably lower owning and operating costs.

**Based on savings from seal replacement alone,** Lifetime Lubricated Rollers soon make up the difference. The metal rings of the Floating Ring Seal can be used over and over again. Take a 14-roller D8. At every roller rebuild, you probably have to buy 28 bellows seals @ $3.97* each or a total of $111.16. Compare this with the rubber "O" rings costing a total of only $45.08*. You save $66.08 in seal replacement costs every time you rebuild or replace. Similar savings are available on all models. And, replacement Lifetime Lubricated Roller and shaft assemblies without end collars are priced below those of Cat Bellows Seal Rollers.

**But your savings don't end here!** Here are other benefits you get from Lifetime Lubricated Track Rollers:

**1. Longer Lived Roller Shells and Component Parts.** The Lifetime Lubricated Roller is much stronger and has more metal in the wear zones, specially hardened for extra resistance to wear. And bushings, bearings and shafts are larger and stronger and will last longer. These components are *always* bathed in *clean,* heat-dissipating oil (not grease). Dirt just can't get in to accelerate wear—oil can't get out, thanks to the patented Floating Ring Seal. This means you won't be buying as many replacement bushings and shafts at rebuild or roller replacement time.

**2. Maintenance Is Eliminated.** Lifetime Lubricated Rollers need no servicing until they're finally rebuilt. You don't have to spend any time nor money for lubrication during the rollers' lives.

**3. Easier Installation.** Snap-on rings hold seals and end collars in place *before* mounting. End collar bolt holes line up easily with track roller frame holes at installation. Your tractors will be on the go much sooner.

See your Caterpillar Dealer. He'll give you the complete facts on the economy of investing in Lifetime Lubricated Rollers . . . for *all* Caterpillar track-type equipment.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

* Suggested consumer prices for these Caterpillar parts

**SERVICE TIP:** Lifetime Lubricated Rollers need no servicing. But when rebuild time finally comes, keep metal rings matched in original pairs.

**CATERPILLAR**

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

*Completely portable* Lima A-W crushing installation has primary 20 by 36-in. jaw crusher, Model 101-CE secondary plant and 7-yd. surge bin. Delivers exceptionally high production for Maymead Lime Co. in Tennessee.

# How Lima Austin-Westerns BEAT RISING COSTS!

Higher output, lower maintenance. These two cost reducers are characteristic of Lima Austin-Western Crushing, Screening and Washing equipment.

Advanced engineering design assures top operating efficiency for years—free of maintenance problems and costly downtime. Improved manufacturing processes and extensive use of anti-friction bearings and heat-treated alloy steels also add to the dependability of this rugged, precision-built machinery.

Lima A-W offers a complete crushing, screening and washing line including jaw and roll crushers, matching screens, conveyors and bins. Stop increasing costs; learn how Lima Austin-Western meets your exact needs for low-cost, accurately sized specification materials. See your nearby distributor or write to Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio.

*Lima Austin-Westerns* available for stationary or portable installation.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA AUSTIN-WESTERN** Crushing, Screening and Washing Equipment

BALDWIN · LIMA · HAMILTON

CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO

607

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Enter 1414 on Reader Card

*¾yd. Lima Type 24 Dragline* **handles fast and easily digging sand and gravel to feed crusher.**

# LIMA a real digging tool!

"It's tops. It's no effort for our ¾-yd. Lima Dragline to feed our crusher with its 100 yd. an hour production. Our previous dragline, not a Lima, couldn't begin to keep up with the loading demands of the crusher." That's what we hear from Hamilton Block and Tile Co., Hamilton, Mich.

"The Lima Jobmaster's a real digging tool. We like its speed and the way it handles. It's inexpensive to maintain, too. In 2 years we spent less than $100 for maintenance and parts. Never had such good distributor service before . . . we've got ourselves a piece of top quality equipment!" The Lima Type 24 is a versatile, air controlled, streamlined machine which combines easy handling and snappy performance with low-cost maintenance. It's a convertible ½-yd. shovel or 13-ton crane offering many important features usually found only on larger capacity machines. Choice of power; crawler, truck or wagon mounted.

Get the facts today from your nearby Lima distributor about the type and size sure to dig or hoist more profit for you! Or write, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

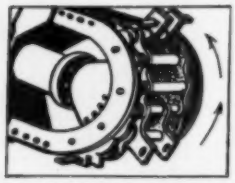
**LIMA** Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

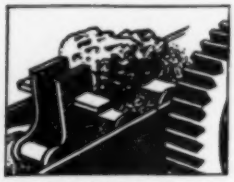
6029

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

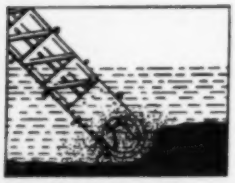
# STEP UP SAND and GRAVEL DREDGING with an EAGLE "SWINTEK" DREDGING LADDER



The "Swintek" eliminates clogged pipe shut-downs—traveling chain screens the intake nozzle.



The "Swintek" carries oversize material up and away from the pumping zone.



The "Swintek" agitates the deposit—greatly increases intake of solids.

Users report big increases in production after installing a "Swintek" on their sand and gravel dredges. A New Jersey operator even reported as much as 400% increase in output. A "Swintek" does what plain suction alone cannot do.

The traveling chain on the "Swintek" ladder screens the intake nozzle keeping out oversize material that would clog the suction line and cause shut-downs and possibly damage the pump. Cutter bars on the chain agitate the deposit greatly increasing intake of solids—these cutters also penetrate stratas of clay if present to get at underlying sand and gravel.

A size and type for every condition—river or pond dredging. If your deposit lies partially under water, or if an artificial pond can be established in a present dry pit, consider a "Swintek" equipped dredge as an economical method for mining aggregates. Reduce manpower and deliver materials to the screening plant together with water needed for washing and classifying. Send for Catalog 83. Also inquire about Eagle Cutter Head Ladders and Eagle All-Steel Compact Dredges.

**EAGLE IRON WORKS**

*ENGINEERS • MANUFACTURERS*

137 HOLCOMB AVE., DES MOINES, IOWA

*Factory-Trained Distributors Everywhere*

SINCE 1872 EIW EAGLE IRON WORKS

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## INDUSTRY NEWS

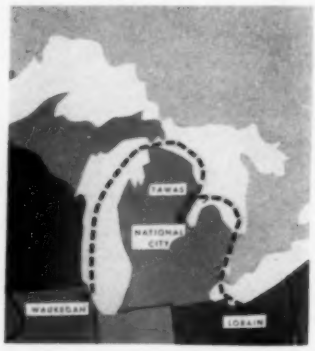
*(Continued from page 58)*

### Drilling, blasting symposium at Colo. School of Mines

THE DATES OCTOBER 17-19 have been announced for the biannual symposium on drilling and blasting at Colorado School of Mines, Golden, Colo. The event is sponsored by the mining departments of University of Minnesota, Pennsylvania State University and Colorado School of Mines.

This is the third symposium devoted specifically to production drilling and blasting. A committee representing the three schools and industry is working out the agenda to interest "the practical man in the field and the academic individual."

### National Gypsum's Lorain plant completes network




NATIONAL GYPSUM CO.'S $25-million Great Lakes production network was completed June 8 with ceremonies officially opening the Lorain, Ohio, Gypsum products plant. This culminated a 7-year exploration, development and construction program. Key points on the map are the quarry at Tawas City, Mich., serving plants at Waukegan, Ill., Lorain, Ohio, and National City, Mich.

### Lafarge Cement makes acquisition

LAFARGE CEMENT OF NORTH AMERICA LTD., through a subsidiary, Lorraine Ready Mix Ltd., is acquiring Anglo Canadian Cement Ltd. of Vancouver, B.C. Assets of the latter include 34 trucks, three mixing plants with daily capacity of 1,400 cu. yd. and a gravel pit.

*(Continued on page 68)*



*Enter 1466 on Reader Card*

# Now "trade" dead weight for payload..and haul 40% faster!

**Heap-load the big-target Payhauler body** in minimum time. Strong rock-ribbed corrugations absorb shock—resist wear and distortion. Choose the "95" with power-shift Torque-Converter, or 9-speed air-shift transmission.

**New strength-multiplying** corrugated body design results in payload-gaining weight reduction of both International Payhauler models. New "95" capacity is increased to 27 tons—and the new "65" becomes the only 19-tonner on the market!

**Look at those exclusive, rock-ribbed body corrugations!** International applies this strength-multiplying principle to reduce Payhauler® body weight by an amazing 30%! You "trade" 2½ tons of power-wasting dead weight for 3 bonus tons of payload capacity in the new 95 Payhauler!

New high-torque, high-output diesel power highballs 27-ton payloads up to 40% faster than the former "95" could haul only 24 tons! The new 375 hp DT-817 International diesel engine gives the new 95 Payhauler the wallop of 40 extra turbocharged "horses."

**Prove to yourself** that top load-carrying capacity plus top power-to-weight ratio give 95 Payhaulers tremendous profit-earning advantages. Add up other big Payhauler exclusives: fast reverse, up to 7.1 mph. for spotting speed; big-target bodies for loading zip; 11-second inverted-hoist dumping; load speeding safety of torqmatic braking and positive power-steering! Let your International Construction Equipment Distributor demonstrate!

**International® Construction Equipment**

**International Harvester Co., 180 N. Michigan Ave., Chicago 1**

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors ... Self-Propelled Scrapers and Bottom-Dump Wagons ... Crawler and Rubber-Tired Loaders ... Off-Highway Haulers ... Diesel and Carbureted Engines ... Motor Trucks ... Farm Tractors and Equipment.

# "Planet-powered '25"

**"Our International TD-25's turbocharged engine** doesn't seem to lug down under load," states Charles Skelton, superintendent for Mulzer Brothers, Tell City, Indiana. "This power, combined with planetary steering and Hi-Lo power shifting gets full loads fast and speeds-up load delivery stripping overburden."

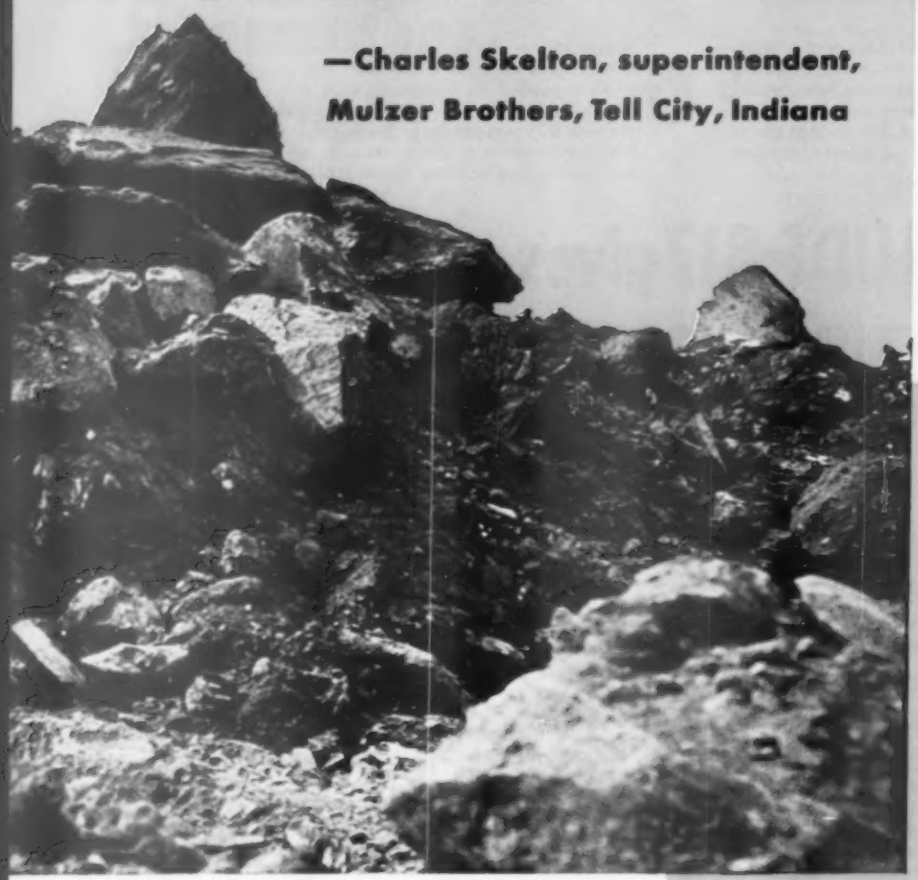
That's another way of saying that the "25," working three shifts daily on this coal-stripping operation, gives operating efficiency a big boost! They're stripping 30-foot overburden to get at a 42-inch coal seam: one-third earth; two-thirds shale, slate, and rock. The "25" takes off the top third—pushing full blade loads an average of 100 feet. A 6-yd. dragline removes the rest.

**How a "25" outblades other rigs up to 50%**—You 'doze straight ahead with heavy offset loads—you make full-load, full-power turns—where giant clutch-steered rigs slip, slue, and spill the load. Exclusive TD-25 "live track" Planet Power-steering eliminates load-limiting "dead-track drag."

With exclusive Hi-Lo, on-the-go power-shifting, the "25" gives you instant, all-the-way matching of power to condition. You roll up big loads in a hurry—and

# gets full loads fast . speeds up delivery, stripping overburden"

**—Charles Skelton, superintendent, Mulzer Brothers, Tell City, Indiana**



**Stripping overburden three shifts daily,** Mulzer Brothers' TD-25 blades full loads, an average of 100 ft. Planet Power-steering and Hi-Lo power-shifting keep full loads on the move full time. On benching or highwalling, simply operate the bank-side track in high speed range, while keeping the outside track in low range—for full-bite, full-blade performance.

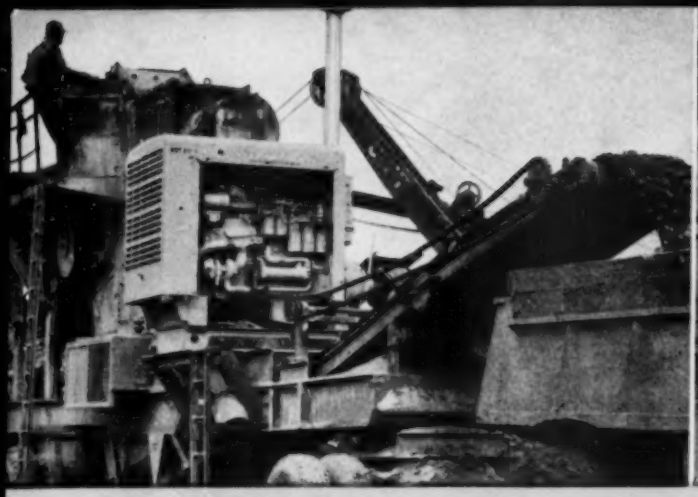
**Here's your 76-page cost and production estimating book—newest, most authentic and complete guide for estimating material-moving costs—and for selecting equipment combinations for top profits, anywhere! See your International Construction Equipment Distributor!**

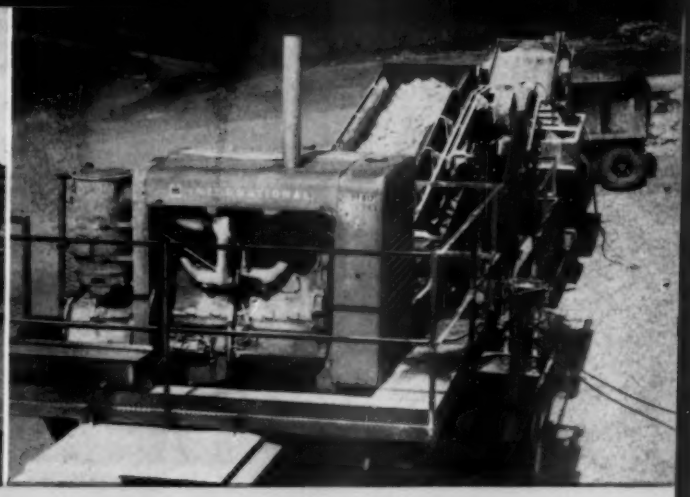
keep 'em rolling fast. And with exclusive International DT-817 Diesel engine wallop, the "25" bulls along, 230 turbocharged hp strong—without "slow-motion" lug-downs, even at high altitudes!

**Press the direct-start button**—power-shift and power-steer the planet-powered TD-25 with full-king-size loads—around curves, upgrade, anywhere. Prove what it means to command full-time, full-load ability to outwork and outearn king-sized clutch-steered crawlers—up to 50%! See your International Construction Equipment Distributor for a demonstration!

*International® Construction Equipment*

**International Harvester Co.,**
**180 North Michigan Ave., Chicago 1, Ill.**
**A COMPLETE POWER PACKAGE**





Roy Baker, of Valley Falls, Kans., got 20,000 hours of trouble-free performance from his original IH diesel before replacing it with a new UDT-817. Other reasons for choosing International were easy installation, direct starting and superior sealing. "Fuel consumption on the 817 is low, and with all that power we can eliminate secondary crushing by just reducing the jaw opening," say the Baker Brothers.

Eugene Nelson of Madison Stone Construction Co., in Wisconsin, got this contract off to a fast start with UDT-817 power. "Our profit depended on continuous high production," he reports. "We aimed at 180 tons per hour, but have been able to load out over 200 tons per hour! Specs called for crushing the hard Niagara limestone to minus one inch. We needed more power in a smaller unit and this UDT-817 fills the bill."

# International UDT-817 gives you best power for BIG CRUSHING JOBS—Here's proof...

The heaviest crushing jobs are easily handled by this rugged International diesel. Field reports, like those shown here, prove big savings result when your crushing plant is powered by a UDT-817. Here's why...1) The UDT-817 develops 385 max. hp to lead the field in its size class. 2) Specific fuel consumption of the UDT-817 is the lowest in its size class. 3) The UDT-817 is the lowest priced engine in dollars per horsepower in its size class.

While the new 385 hp UDT-817 diesel heads up the International engine line, you can choose from 34 other diesel and carbureted models ranging upward from 16.8 hp. Save on operating and repowering costs by checking with your International Engine Distributor or Dealer, or by specifying dependable International power in new machines. All 35 engines have one common feature: fastest payback power for users.

The West Texas Construction Co. of Lubbock, is crushing caliche at 300 tons per hour with UDT-817 diesel power. The rock is crushed to minus 1¾ inch. Limited by feeder capacity, the big, new International delivers only 265 continuous hp @ 1,800 rpm.—that's power to spare! Other IH power on this job includes a carbureted U-264 engine on the feeder, and a UD-18A diesel on the air compressor.

INTERNATIONAL® ENGINES

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois

A COMPLETE POWER PACKAGE

**OWNERS REPORT:**

# How exclusive clam-action 4-in-1 MAKES MONEY where other rigs don't!

## "4-in-1 break-out action saves time and shooting costs"

**—Albert Boehman Coal Mine, St. Meinard, Indiana**

**Albert Boehman Coal Mine uses** an International Drott TD-6 Four-in-One to strip overburden, clean the vein, and load out coal. "I particularly like the 4-in-1's (pry-over-shoe) break-out action which heap-loads the bucket fast, and usually saves 'shooting' costs. The 4-in-1 has the work-producing features of several machines in one." *Here his TD-6 Four-in-One is "digging coal"* directly from the vein it uncovered and cleaned. The 1⅛ cu. yd. TD-6 can apply a tremendous 18,600 lbs. of break-out force!

## "Bottom-dumping 4-in-1 cleans itself out"

**—Marion Young, Bloomington, Indiana**

**"I tried another rig** for a month and had to clean out its bucket with a spade—and that slows you down with 600 to 700 lbs. of dirt stuck in it," states excavating-loading contractor Marion Young. "My bottom-dumping 4-in-1 cleans itself out when I flap the clam (hydraulically)." Here his 4-in-1 is loading wet river-bottom gravel. Exclusive 4-in-1 bottom-dumping eliminates the sticky materials problem!

## "Our 4-in-1 replaces several other rigs"

**—Joseph Borge & Sons, Inc., Swansea, Mass.**

**Joseph Borge & Sons, Inc.,** produce washed sand and gravel from open pits—use their TD-15 Four-in-One to strip overburden, load out, and recontour worked-out pits. Owner reports loading out 1,200-1,800 tons of material per 8 hrs. "Four-in-One versatility and capacity replace several rigs for us," states Vice-president, George Borge. "The clam-action also digs faster and dumps cleaner." Above, their 4-in-1 is "back-dragging" from gravel bank, to speed loading.

**Why limit your income** to what an old-style, single-action loader, or any other limited-duty rig can earn you? See how an International Drott 4-in-1 can give you a whole equipment spread of actions—and each action can double for one or more costly specialized machines. Prove Hydro-Spring performance protection. See your International Drott Distributor for a 4-in-1 demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

16 MODELS of FULLER 3-SPEED AUXILIARIES

*Specify* **FULLER...**
*Specify the* **MODEL**
*Get the 3-speed auxiliary designed for your job.*

**HIGH CAPACITY... WIDEST RANGE OF RATIOS... OPTIONAL TOP-MOUNTED POWER TAKE-OFF... LOW INITIAL COST, LESS MAINTENANCE... AVAILABLE FROM ALL LEADING TRUCK MANUFACTURERS ON SPECIFICATION**

*Choose from 16 Models of FULLER Three-Speed Auxiliaries*

**FULLER MANUFACTURING COMPANY**
**(Transmission Division)**
**KALAMAZOO, MICHIGAN**
**Subsidiary EATON Manufacturing Company**

*Enter 1455 on Reader Card*



*(Continued from page 62)*

## Bulk transfer plant

CALAVERAS CEMENT CO.'s new bulk cement transfer plant has been opened in Springfield, Ore. Serving as a distributing point for truck delivery in the 13 southern counties of Oregon, the plant receives bulk cement by rail from the Calaveras plant at San Andreas, California.

The two storage silos have a total capacity of 2,350 bbl. of bulk cement, and the warehouse holds four railroad cars of sack cement. When Calaveras' new plant at Redding, Calif., begins production in 1961, the Springfield transfer plant will receive bulk cement shipped from there.

## Minerals & Chemicals contemplates merger

MINERALS & CHEMICALS CORP. OF AMERICA is planning to merge with Philipp Brothers, Inc., and Philipp Brothers Ore Corp. The merged corporation will be known as Minerals & Chemicals-Philipp Brothers, Inc.

James Deshler, chairman of Minerals & Chemicals, will continue as chairman. Vice chairman will be Siegfried Ullmann, president of Philipp Brothers Inc. and chairman of its subsidiary, Philipp Brothers Ore Corp. Charles A. Specht of Minerals & Chemicals will continue as president, and Ludwig Jesselson and Leo Forchheimer, officers of the Philipp companies, will become executive vice president and senior vice president, respectively. Alfred G. Blake will continue as executive vice president.

Philipp Brothers, Inc. and its subsidiary are importers, exporters, processors and merchants in ferrous and nonferrous ores, metals and minerals. They operate in the United States and, through subsidiaries, abroad.

Minerals & Chemicals produces and processes kaolin, attapulgite, activated bauxite and limestone products. Mines and plants are in Arkansas, Florida, Georgia, Michigan, Ohio and Virginia, and a research center is at Menlo Park, N.J. The merger is expected to create additional opportunities in fields related to ores, metals and minerals, both in the United States and in other countries.

## Monitoring system called vital to pollution control

THE AIR POLLUTION monitoring system at the Brewster, Fla., phosphate plant of American Cyanamid Co. has been indispensable in determining control measures necessary for maximum production without air pollution. So reported Charles R. McHenry, an industrial hygienist in Cyanamid's central medical department, in a paper delivered to members of the Air Pollution Control Association.

He described the procedures begun in 1956 when the company decided to build a triple superphosphate plant in an expansion of the Brewster operations: (1) Incorporation of certain engineering controls in the blueprint specifications of the new plant; (2) undertaking a 5-year environmental study still in progress, that includes continuous monitoring of fluoride content of air and water, soil samples and vegetation, and collection of meteorological data and (3) final evaluation of data obtained by monitoring, which will be made available to industry, government and other specialists concerned with air pollution.

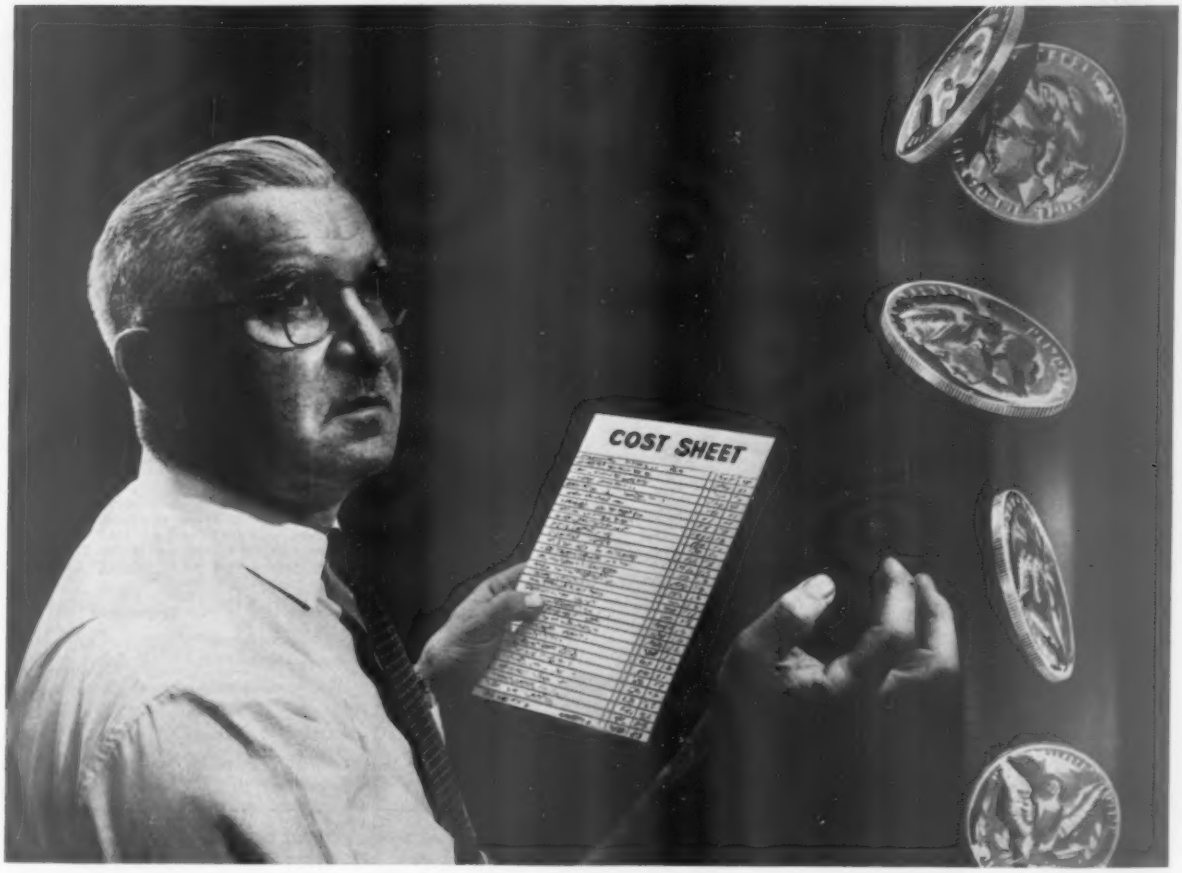
## Smell control—another industry problem attacked

NOISE AND DUST, two problems about which industry has been doing a great deal, are joined by a third subdued offender—odor. The elusive industrial by-product is getting increasing attention; last year manufacturers spent about $60 million on odor-control programs, almost double the amount spent five years ago. Trade sources predict that the figure will rise to $75 billion by 1961, says The New York Times.

There are several methods of dealing with odors—masking, combustion, absorption and adsorption. Odor counteraction is a new method based on the theory that certain pairs of odors are antagonistic and when two are sniffed together, the intensity of each is diminished. Airkem, Inc., a manufacturer specializing in odor control, has formulated more than 200 counteractants to eliminate specific industrial odors. Among its customers: Penn-Dixie Cement Corp.

*(Continued on page 71)*

# ALLIS-CHALMERS




# How to plug profit-leaks with more efficient screens

A shutdown can be costly . . . inefficient screening can be even worse. Dollars can be slipping away every day — dollars that belong in your profit picture — if you're getting less than top performance out of your screens.

Solving screening problems is an old story with A-C engineers. That's why A-C screens are so well known for their low-cost production.

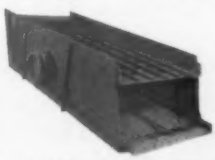
Every A-C screen is rugged enough to work around the clock on such operations as scalping, sizing, washing and rinsing . . . every A-C screen has features built in to give you the maximum efficiency and top performance that stop potential profit-leaks before they start.

*Let A-C engineers tackle your screening problems. Simply send them to us and Allis-Chalmers will submit an engineered recommendation on the most economical screen for your particular job.* **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wisconsin.*

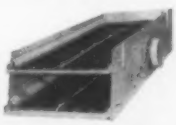
Aero-Vibe, Low-Head, Ripl-Flo and ROM are Allis-Chalmers trademarks. A-1353

AVS **Aero-Vibe** inclined screen for economical sizing, up to 1½ inches, wet or dry.

**Low-Head** horizontal screen for efficient coarse to fine sizing (wet or dry), rinsing, washing, dewatering, media recovery.



XH **Ripl-Flo** inclined screen for cost-saving scalping and coarse sizing, wet or dry.



SH **Ripl-Flo** inclined screen for light scalping, coarse or fine sizing (wet or dry), rinsing or washing.

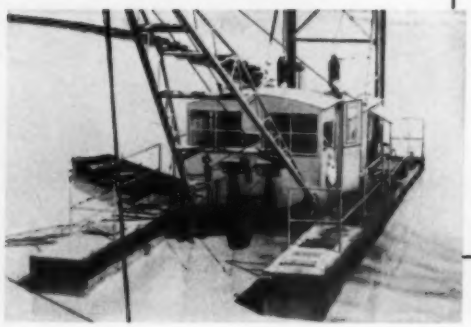
XXH **ROM** inclined screen, a brute for tough primary scalping jobs and high tonnage.

*Enter 1440 on Reader Card*

# 300,000 TONS IS A LOT OF SAND!

## Yet this Pump has delivered that tonnage

# WITHOUT WEAR!



Hardy SAND COMPANY
NATURAL BOND AND SILICA

April 5th, 1960

E. A. Thomas
Thomas Foundries, Inc.
P. O. Box 1111
Birmingham, Alabama

Dear Mr. Thomas:

I regret to say, but I am afraid the Hardy Sand Company will not be a very good customer for repair parts such as liners, impellers etc., for our Thomas DURABLE Dredge Pump, Model HL.

I had occasion to look at the interior of the pump mounted on our dredge at Plant #4 and could see no wear, just brightened up. Incidentally, this view of the pump was after pumping approximately 300,000 tons of sand. I might underscore that word "DURABLE" in the above.

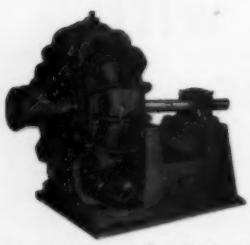
At this rate, it will be a couple more years before we scream for parts.

Very truly yours,

Hardy Sand Company

T. H. Hardy, Partner

Left: Sand Dredge of Hardy Sand Company, Evansville, Indiana, equipped with Thomas DURABLE Dredge Pump, Model HL.



That's another Thomas Pump owner talking. With a touch of humor, he regrets that "it may be a couple more years before we can scream for parts"!

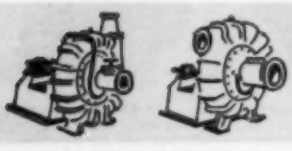
He writes this—after his pump has been in operation for about a year and a half and delivered approximately 300,000 tons of silica sand! No wonder he feels in a good humor—he has something to laugh about. When he recently inspected the liners and impeller of his Thomas Pump, those parts showed "no wear, just brightened up."

Now he suggests that the word "DURABLE" be underscored. And there are many, many other Thomas Pump owners who will agree with him!

Thomas Pump's INCREASED SERVICE LIFE is due to improved design and modern materials. The Thomas Pump is especially designed for the use of Thomas Ni-Hard alloy, a metal which is highly resistant to abrasion. The net result, proved by operating reports from all sections, is that "YOU CANNOT BUY AT ANY PRICE A MORE DURABLE PUMP FOR SAND AND GRAVEL—YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY."

Write or wire for further information.

**Thomas Durable Dredge Pumps are manufactured in range of sizes from 6" to 16" discharge. Write or phone for additional information.**



## THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA

*Enter 1415 on Reader Card*

*(Continued from page 68)*

## Worth broadcasting

THE SAFETY RECORD of Ash Grove Lime & Portland Cement Co.'s Springfield, Mo., plant gets more remarkable with each passing day. To give publicity to its ten-year-plus operation without a lost-time accident, the company erected this sign on the plant grounds. The number is changed each day.

## Nez Perce Cement Corp. is organized in Idaho

A NEW CEMENT COMPANY, Nez Perce Cement Corp., has been incorporated in Idaho for $5 million capital stock. A report from Lewiston quotes Elbert A. Stellmon, secretary, that the company plans to construct a plant at the limestone quarry in Mission Creek Canyon owned by the Nez Perce Indians. Development may require $15 million.

Persons associated with the corporation also have a lease on the large deposit of lime rock above the mouth of the Grande Ronde River in Washington, he said. Curtis W. Cannon, Boulder, Colo., and Edward F. Arn, Wichita, Kan., are president and vice president of the new corporation.

The quarry at Mission Creek Canyon has been operated by Lewiston Lime Co. for the last 20 years, ending March 31. There is presently litigation over royalties between the company and the Bureau of Indian Affairs.

## Baker quarry sold to General Crushed Stone

THE STONE QUARRY near Verdon, Pa., of J. E. Baker Co., York, Pa., has been sold to The General Crushed Stone Co., Easton, Pa. Included in the purchase, for a reported $55,801, were equipment and seven tracts of land in Beaverdam district.

*(Continued on page 72)*

**SIDE DUMPS** for ROCK, EARTH, ORE

**PAN ▶ TYPE** truck bodies and trailers 14 to 45 TONS dumped by EASTON electric overhead hoist

◀ **DROP DOOR** truck bodies and trailers 14 to 40 TONS dumped by integral hydraulic body hoists

**SIDE DUMP ▶ TRAINS** pan type and drop door capacities unlimited

Variable Wheel Base ◀ **REAR DUMPS** capacities 22 and 35 TONS

★★★★★★★★★

**EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.**

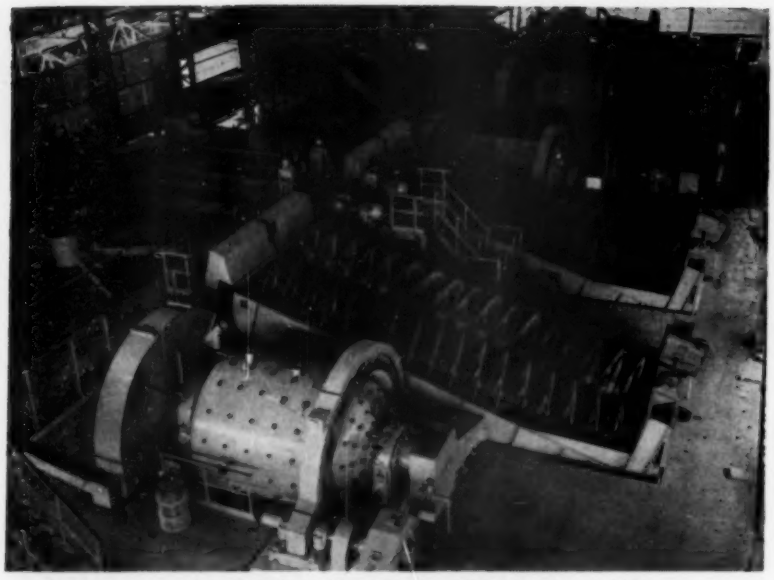
★★★★★★★★★

WRITE FOR CATALOG **A**

B-1084

**EASTON**®

*Enter 1454 on Reader Card*



Shown here are four Hardinge 9-3-6-8 Tricone Mills grinding sulfide copper ores and mixed ores in a concentrating plant in the Belgian Congo, Africa.

# CORRECT BALL SEGREGATION
in the
# *Hardinge* TRICONE MILLS

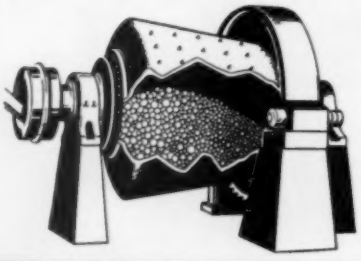
Shop view of a 10½′ Tricone with 9′ long tapered shell.

Highest grinding efficiency and lowest ball and lining wear are common to mills with a correctly segregated ball charge.

The Hardinge Tricone Mill is the only mill providing these essentials to low cost operation without the use of special linings or internal devices, which are subject to wear and are effective through only a part of their wearing life.

The Tricone also occupies less floor space for its grinding volume than any other ball mill built.

Every ball in the Hardinge Tricone Mill "minds its own business!" ▶



*Complete specifications upon request. Bulletin AH-414—7.*

**HARDINGE**
COMPANY, INCORPORATED
Main Office and Works • 240 Arch St., York, Pa.
"Hardinge Equipment—Built Better to Last Longer."

NEW YORK
TORONTO
CHICAGO
HIBBING
SALT LAKE CITY
SAN FRANCISCO
HOUSTON
LAKELAND
BIRMINGHAM

*Enter 1474 on Reader Card*




*(Continued from page 71)*

## Westerners have higher per-capita cement use

THE AVERAGE WESTERNER accounts for almost 9½ sacks of cement per year as against slightly more than 7 sacks nationally, said Permanente Cement Co. in its annual report. A special section of the report predicts that the increasing per-capita consumption of building materials, in combination with the West's high rate of population gain, will raise demand for cement beyond all present official estimates by 1969.

The company will invest approximately $16 million for new and improved facilities in 1960, compared with $10.3 million in 1959. Included are completion in August of a cement plant near Honolulu, Hawaii, and a gypsum products plant in New Mexico in May.

A major effect of the Hawaii plant and the purchase and recent expansion of the Olympic Cement plant at Bellingham, Wash., will be a reduction in the need to ship cement to these areas. This increases the supply available to northern California by 2 million or more bbl. per year.

## New cement plant in the Philippines

MINDANAO PORTLAND CEMENT CO., Manila, P.I., is building a new cement plant at Iligan City, Mindanao. Delivery of equipment for the 3,000-bbl.-per-day plant will start about the end of this year, and actual production is planned for mid-1961.

Fuller Co., Catasauqua, Pa., has a $2.5-million contract to supply all the basic equipment for the plant—Airslide and Fuller-Kinyon pneumatic conveying systems, Fuller-Humboldt suspension type preheater, Airmerge quadrant blending system, horizontal grate cooler, single and two-stage rotary compressors, control panels and auxiliaries, such as high and low-level bin indicators, rotary valves and feeders.

Participating in the projects will be Fuller subdivisions: Traylor Engineering & Mfg. Division will furnish ball mills for raw and finish grinding and a rotary kiln; Dracco Division will supply multibag dust collectors, and Lehigh Fan & Blower Division will supply induced draft fans. Fuller's subsidiary, Sutorbilt Corp., will furnish rotary positive blowers.

END

# Where heavyweights move job records prove...

# FIRESTONE TOUGHNESS PAYS OFF BIG!

Extra toughness: you get it in the cord, in the rubber . . . in every inch of Firestone off-the-highway tires. And it pays off big! Helps keep equipment on the job; helps keep jobs on schedule. Behind Firestone toughness are such exclusives as (1) Firestone Rubber-X, longest-wearing rubber ever used in Firestone tires and (2) Firestone Shock-Fortified nylon cord for top protection against impact damage. Through Firestone's Giant Tire Service, an expert will match tires to your job, and handle all tire maintenance. Just contact your Firestone Dealer or Store. Or write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Co., Akron, Ohio.

**ALWAYS SPECIFY FIRESTONE TIRES WHEN ORDERING NEW EQUIPMENT**

Super Rock Grip Wide Base* Super Rock Grip Deep Tread*

**TUBELESS OR TUBED**

**Firestone**

***BETTER RUBBER FROM START TO FINISH***

Copyright 1960, The Firestone Tire & Rubber Co.
*Firestone T.M.

*Enter 1437 on Reader Card*

# In Cement and Aggregates the Word for Air Separation is "Sturtevant"

## in cement...

*Sturtevant Air Separators make possible highly efficient closed-circuit systems.* Large circulating loads increase output, eliminate overgrinding. Ball and lining life lengthens, power costs are lowered. Top quality cement results from precise control of finenesses. Standard 16 ft. Sturtevants deliver raw fines up to 70 tph, finished fines up to 260 bph.

## in aggregates...

*Sturtevant Air Separators classify sand without water, clean sand by de-dusting it.* Pre-classification by air can also increase screening production by removing screen-blinding fines. In blending operations, Sturtevants select desired fines from grinder throughput. This graded product is then used to overcome fineness modulus deficiencies.

*Send for Air Separator Bulletin No. 087.*

**STURTEVANT**
MILL COMPANY
102 Clayton St., Boston, Mass.
Crushers • Grinders • Micron-Grinders • Separators
Blenders • Granulators • Conveyors • Elevators
Enter 1445 on Reader Card


# CALENDAR

## OF COMING EVENTS

### 1960

**July 20-23, 1960**
National Crushed Stone Association, Board of Directors' Mid-Year Meeting, The Greenbrier, White Sulphur Springs, W. Va.

**October 3-6, 1960**
National Sand and Gravel Association, Semi-Annual Meeting, Board of Directors, Del Monte Lodge, Pebble Beach, Calif.

**October 10-13, 1960**
American Mining Congress, 1960 Metal Mining and Industrial Minerals Convention and Exposition, Las Vegas, Nev.

**October 13-15, 1960**
Empire State Sand, Gravel and Ready Mix Association, Fall Conference, Hotel Syracuse Country House, Syracuse, New York

**October 17-19, 1960**
Biannual Symposium on Drilling and Blasting, Colorado School of Mines, Golden, Colorado

**October 18-19, 1960**
Cement, Quarry and Mineral Aggregates Section, National Safety Congress, Conrad Hilton Hotel, Chicago, Ill.

**November 3-4, 1960**
National Slag Association, Annual Meeting, Hotel Mayflower, Washington, D.C.

### 1961

**January 17-19, 1961**
National Limestone Institute Inc., 16th Annual Convention, Statler-Hilton Hotel, Washington, D.C.

**January 17-20, 1961**
National Crushed Stone Association, 44th Annual Convention, Hotel Americana, Bal Harbour, Fla.

**January 23-26, 1961**
National Sand and Gravel Association, 45th Annual Convention, Hotel Americana, Bal Harbour, Fla.

**Jan. 29-Feb. 3, 1961**
American Society for Testing Materials, Committee Week, Netherland Hilton Hotel, Cincinnati, Ohio

**March 5-8, 1961**
American Road Builders Association, 59th Annual Convention, Atlantic City, New Jersey

**April 12-14, 1961**
American Institute of Mining, Metallurgical and Petroleum Engineers, International Symposium on Agglomeration, Sheraton Hotel, Philadelphia, Pa.

**April 18-20, 1961**
American Institute of Electrical Engineers, Cement Industry Technical Conference, The Sheraton-Cadillac, Detroit, Michigan


Enter 1446 on Reader Card

# NEW D8H FEEDS 375 TONS OF GRAVEL PER HOUR—STILL HAS TIME FOR STOCKPILING

"Double-duty" is easy for the powerful, new Caterpillar D8 Series H Tractor at the Glacier Sand & Gravel Company of Steilacoom, Washington. Powered by a 235 HP Turbocharged D342 Engine and equipped with a No. 8S Hydraulic Bulldozer, the D8H divides its time equally feeding the gravel plant and stockpiling.

Says Superintendent J. W. Wyckoff, "We like the hydraulic 'dozer . . . and we are well pleased with the all-around performance and track life of our D8 in this highly abrasive material."

Operator J. W. Hendricks also adds, "Best tractor I ever ran. Work in 3rd gear practically all the time. Doesn't tire me out."

Other features of the Series H that rate high with owners and operators alike include: (1) the *full* Power Shift Transmission (optional) for faster cycle times; (2) service-free lifetime lubricated track rollers with patented *floating ring* seals; (3) stronger undercarriage for longer track life; and (4) power and fuel economy of the turbocharged engine.

Your Caterpillar Dealer can give you all the facts on the great, new D8 Series H Tractor along with proof of how it can pay off big on your operation. Call him soon.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

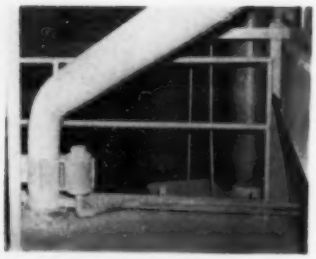
**CATERPILLAR**

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE D8 SERIES H
MAKES THE
HARD JOBS SEEM EASY

# HINTS & HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN



## Atomic age comes to the rock products industry

ROCK PRODUCTS PRODUCERS have been quick to take advantage of the newest tools using industrial atomic energy. Portland cement producers, in particular, have found that these tools and devices close up many of the gaps in process control—one more step to make the system more automatic.

Energy source for all these tools is an isotope of some element which gives off gamma rays; Cesium-137 is commonly used. The high-energy rays easily penetrate fabricated steel plate or pipe. Each device consists of a "source"—a shielded holder for the tiny bit of radioactive material—and a "target" which adsorbs and senses the intensity of the stream of rays. Properly installed, these tools are completely safe.

So far we have seen three applications in cement plants. The nuclear bed depth control has been used to control clinker cooler operation. (ROCK PRODUCTS, Feb. 1960, p. 150.) Wet process plants use another version to sense the density of slurry coming out of the mills grinding raw materials, Fig. 1.

Another cement plant uses three of these instruments to control the flow of raw materials through a steel surge bin. Fig. 2 shows the two devices fixed to the top of the bin. One signals the operator at the crusher-feeder station that the bin is full, while the second unit stops the machinery bringing raw materials to the bin.

Far below these two controls is the third which starts and stops the feeder drawing materials out of the bin. In this way, there is always a bed of material in the bottom of the bin to cushion the feeder from the impact of material dropping the full depth of the bin.

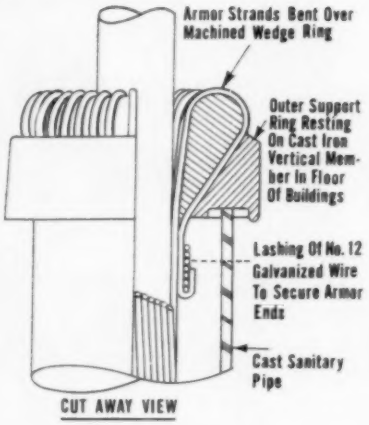
Other enterprising producers are exploring ways of using these nuclear devices to generate signals for automatic control of mechanical or chemical processes.

## Traffic light

IT'S NOT that there is so much traffic at this aggregates producer's plant, but that the trucks with trailers are so long. The scale platform is long enough to accommodate the long tandem-trailer rigs which are common in the western states.

In addition to the usual "stop" and "go" lights, the signal has one marked "back up" and another marked "office." So with this array of lights it is a simple matter for the scale operator to spot the largest rig quickly or to issue other instructions to the driver. The signals are operated by foot pedals so that the scaleman can work the automatic loading hoppers, use the two-way radio and fill out shipping papers with his free hands.

## Armored cable terminal


Armor Strands Bent Over Machined Wedge Ring
Outer Support Ring Resting On Cast Iron Vertical Member In Floor Of Buildings
Lashing Of No. 12 Galvanized Wire To Secure Armor Ends
Cast Sanitary Pipe
CUT AWAY VIEW

WE HAVE LEARNED that the additional cost of armored cable is well justified when the delays and expense caused by insulation failures of wire-in-conduit is totaled up for the year.

Armored cable we purchased was provided with ample spare pairs of conductors, not so much as a safeguard of having standby circuits available as outage occurred on any given pair, but to have circuits available for expanded operations in later years. The manufacturer guaranteed that the conductors would not fail if the proper protective features were installed on each circuit.

The cable was installed in tar-impregnated ducts laid in concrete with the riser portion consisting of cast iron pipe to better withstand the abuse at ground level. The maintenance force turned out two sets of rings of wedge-

*(Continued on page 79)*

Johnny Unitas demonstrates newest H&W high strength-packaging paper . . .

# EXPANDA-KRAFT

## THE GREAT NEW NAME IN EXTENSIBLE KRAFT

**THIS AD IS PRINTED ON EXPANDA-KRAFT WHITE**
You can also buy Expanda-Kraft
in Semi-Bleached or Natural. Imagine how attractive *your product*
would look, packaged in Expanda-Kraft.
To learn how well your product can be *protected* by Expanda-Kraft, see other side . . .

# EXPANDA-KRAFT

## DEFIES SHOCK!

The bullet passes of Johnny Unitas have the terrific impact to rip through regular kraft (above), yet, thrown at the same speed, they bounce off Expanda-Kraft because of its greater resiliency (left). Johnny Unitas, all-pro quarterback of the Baltimore Colts, demonstrated the toughness of Expanda-Kraft at the National Packaging Show in Atlantic City. Each target consisted of four plies of 50-lb. basis weight stock. Time after time, in standard drop tests, bags made of Expanda-Kraft have proved their superior strength.

Expanda-Kraft is the winner in impact test against regular kraft. Bags of each type were filled with sand, suspended on long ropes, sent hurtling toward each other. Regular kraft bag, photographed at high-speed as it burst, had same ply construction as Expanda-Kraft bag.

**EXPANDA-KRAFT REDUCES BREAKAGE** It has *two-way stretch*, soaks up shocks that would break ordinary kraft of equal basis weight.

**EXPANDA-KRAFT WITHSTANDS MOISTURE** *High humidity* and *weathering* have little effect on Expanda-Kraft! It retains its full toughness and firmness.

**EXPANDA-KRAFT PRINTS SHARP** This advertisement is printed on 50-lb. Expanda-Kraft White from a regular production run. Other shades print as well to enhance sales appeal.

**EXPANDA-KRAFT BAGS STACK SECURELY** They have a coefficient of friction higher than regular kraft bags, stack with less risk of slippage, stay in place while in transit.

**EXPANDA-KRAFT BAGS FILL FAST** They meet required porosity standards, yet are rigid enough to stand up to high speeds on the filling line.

**HOLLINGSWORTH & WHITNEY** DIVISION OF
**SCOTT PAPER COMPANY**

CONTACT YOUR MULTIWALL BAG SUPPLIER for information on the use of Expanda-Kraft where rigidity, resilience, strength, moisture resistance and uniformity are required. Expanda-Kraft is made by a new roll-crepe process and is available to multiwall bag manufacturers in 40, 50, 60, 70 and 80-lb. basis weights; White, Semi-bleached or Natural. *Hollingsworth & Whitney, Division of Scott Paper Company, Dept. G, Chester, Pa.*

*continued from page 76*

shape pattern that were used to make up the terminal ending for the armor portion of the lead-sheathed communications circuits.

A string tied about the elevation measured for the ending of the outer armor wires guided the hack saw. Then the wedge ring was installed over the cut ends and these were then formed around the wedge and extended down for the return bend that is held in place by seven turns of 12-in. galvanized wire.

The completed deadend is permitted to rest on the outer support ring which rides the extremity of the cast iron vertical pipe section. This support ring is slipped over the cable end before any work is started on the armor.

**Paul C. Ziemke, Clinton, Tenn.**

## Trash cans are for trash

IT IS TRADITIONAL that sweepers in almost any rock products plant put dust and trash into the same containers and haul them to the dump together. A midwestern cement plant's industrial engineers figured that most, if not all, of the dust came out of the process. Then it was a simple matter to figure that savings could be realized if the sweeper's product could be returned to the processing system. Now there are a liberal number of openings cut into the chutes so that dust may be put back into the system.

## Cobble screen

A BIG FIELD HOPPER for loading trucks makes the first size separation for an Illinois sand and gravel producer. The top of the bin is fitted with a steep grid to scalp off plus 12-in. boulders. Then the dragline scoops them up and returns them to a remote corner of the excavation.

Compressed air is piped to the two gates under the big hopper. The truck operators load and trim their own rigs and in this way make a few extra round trips each day.

## Fast shipping

WHEN A MIDWESTERN crushed stone producer wanted to make sure that he could load trucks and get them on their way in a hurry, he designed this ingenious system.

One truck can be loaded in the conventional way, by driving directly under the bottom of the hopper. But in the meantime, another truck can be filled with the belt conveyor projecting from the side of the bin. The conveyor draws material out of the bin through a vertical chute inserted into the hopper side of the big bin. The frame of the conveyor is fixed to clear most trucks, but it can be raised easily if units with particularly high sides are to be loaded regularly.

## Movable screen chutes

WHEN A MIDWESTERN sand and gravel producer built a new plant, he specified that all vibrating screens be equipped with discharge hoods mounted on rails. (This idea, incidentally, he got from a Hints and Helps item in May, 1958, ROCK PRODUCTS, p. 68.) But at the suggestion of the screen manufacturer, splitter gates were built in.

The discharge hoods can now be unlatched and backed away from the screen to provide plenty of room to get at the screen cloths or frames. The splitter gates can be adjusted easily with levers, and paint marks on the housing show the operator the setting for a given ratio of dividing the flow of material.

**END**

### Contributions? Of course

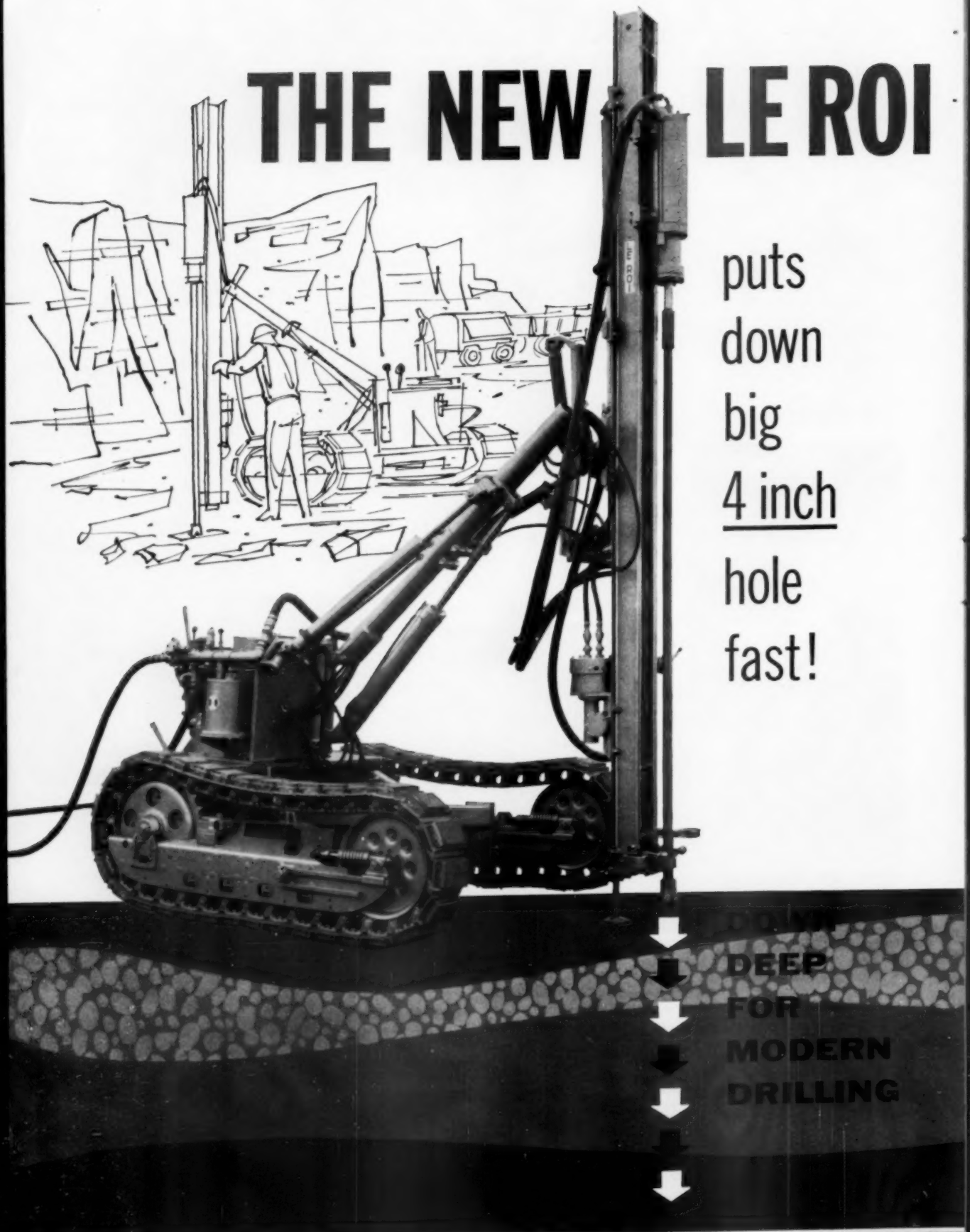
When we visit rock products plants in our travels we are frequently asked if contributions are accepted for Hints and Helps. The answer is—of course they are.

The editors in the field keep a sharp eye out for a producer's ingenious mechanical inventions but they cannot possibly notice every one. So, if you have a Hint and Help in your plant, feel free to send us a brief description along with a photo or sketch.

You will then have the satisfaction of helping producers in all parts of the country. And for your helpfulness, ROCK PRODUCTS will send you a crisp green check for $5.00.

# THE NEW LE ROI

puts
down
big
<u>4 inch</u>
hole
fast!



Drills at any angle

# TRAC-NEWMATIC

Here's Le Roi's brand-new, hardworking crawler drill — The Trac-Newmatic.

The Trac-Newmatic carries a big 5-inch drifter on an extra-sturdy air-powered feed shell . . . all mounted on a hard-lugging crawler that can pull a 600 rotary along with it over rough terrain.

The 5-inch drifter features a striking-bar design that efficiently squeezes every ounce of power out of the available air . . . minimizes leakage and blow-by . . . drills 4-inch hole fast. What's more, the drifter has forward, neutral, and reverse rotation to assure fast driving, easy extracting, and speedy steel-uncoupling or coupling.

An air-motor driven hydraulic pump is used to quickly position the feed shell for breast- or lift-hole drilling either straight ahead or over the tracks to give a wide drilling pattern from a single location. A standard model with hand-operated hydraulic pump to raise and lower the boom is also available.

Tramming is easy, too . . . two hefty 7½ hp reversible air motors give the Trac-Newmatic plenty of power, while the oscillating tracks permit tramming or parking even on irregular terrain. Controls are mounted for both convenient operation and good visibility, and a "deadman" feature anchors the unit in place when the tramming levers are released.

See the Trac-Newmatics at your Le Roi distributor — or write us for more detailed information. Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin.

. . . on uneven terrain

. . . straight ahead

## LE ROI NEWMATIC® AIR TOOLS

. . . straight down

PORTABLE AND TRACTAIR® COMPRESSORS • STATIONARY COMPRESSORS • AIR TOOLS

. . . or over-the-tracks

AT-015

# THEY STOOD THEIR GROUND IN LOUISVILLE

by Joseph N. Bell

**FOR TWO YEARS—through a rugged labor negotiation, a crippling strike and a series of court actions—a group of sand and gravel and ready-mixed concrete operators in Louisville, Ky., have been working in sometimes uneasy concert to make a point for management. With a new labor negotiation coming up again next summer and part of their problem still in the courts, the Louisville producers are not yet out of the woods. But they have managed to stand firm for their own principles—and they have done it as a group. Herein lies a lesson for every rock producer in North America.**

**"When a covey goes up," one of the Louisville producers told me, "a hunter can pick 'em off much more easily one at a time. When most small businessmen negotiate with a union, they send in a management team that practices only once every year or two, against a bunch of experienced union**

*Part 2 of* Rock Products' *Labor Series: Louisville producers are not yet out of the woods, but they have managed to stand firm for their own principles—and they have done it as a group*

professionals who practice all the time. But by banding together, management can get more practice, send in more seasoned professionals—and, thus, put up a better showing. That's what we tried to do in Louisville."

The Louisville producers have been bargaining cooperatively for more than 20 years—through a group called the Building Material Dealers & Haulers Association. Ten local companies belong to this group; two do not. The members represent about 80 percent of ready-mix concrete production in the Louisville area.

On the other side of the negotiating table sits Local 89 of Mr. Hoffa's Teamsters Union. Although there have been some tough negotiations between two camps, there had never been a strike until the summer of 1958. Louisville is still debating and adjudicating the after-effects of that strike which raised an interesting and far-reaching legal question: When a Union strikes one member of a negotiating group, is it—in effect—striking the whole group? The Louisville operators said "Yes," and closed down their plants when one member was struck. The Union said "No," and their point of view prevailed with the Kentucky Unemployment Compensation Commission. The employers, however, appealed to the state courts, and the Circuit Court denied unemployment compensation to the workers in this case on the grounds that the action was a strike and not a lockout. This decision has been appealed by the Union and will probably be in litigation for another year or longer before a higher court decision is rendered.

There are many lessons for rock industry operators to learn from the negotiations and strike that preceded the court action in the Louisville case. Let's examine a brief calendar of these events before seeking conclusions to be drawn from them.

- April 17: Employers met to select a committee who would represent them in the upcoming negotiations.
- April 29: Committee met with full employers' group and the various company attorneys to obtain group approval for the stands they planned to take in the bargaining sessions.
- May 22: First meeting between employers' committee and the Union local. Management represented by attorney and five-man committee; Union, by two business agents and a committee of five workers.
- May 28: Report by management committee to full employers' group.
- June 2, 9 and 19: Negotiating sessions with the Union committee. No progress.
- June 26: Report to employers' group by management committee.
- June 27 and 30: More negotiations. Union enlarged area of disagreement by backing off points on which management thought agreement had been reached.
- June 30 (midnight): Contract expired. Producers agreed to a 15-day retroactivity period; Union agreed to keep men at work during further negotiations.
- July 7: Meeting of full employers' group to give instructions to negotiating committee.
- July 8: Twelve-hour negotiating session with Union. Federal mediator called in for the first time.
- July 10, 11 and 14: Almost continuous negotiating session, but still no progress, in spite of efforts of mediator.
- July 15: Report of negotiating committee to full employers' group.
- July 16 (a.m.): The plant of one of the ten negotiating companies was struck without advance warning. At a meeting of all members of employers' Association, it was agreed that striking one member constituted a strike against all. A telegram so notifying the Union was drafted and sent for delivery the following morning. The telegram said:

"The member firms of the Louisville Building Material Dealers & Haulers Association construe the strike called by your Union yesterday against one of our member companies to be an action against the bargaining rights of the Association and its members. In order to protect the existence of the bargaining powers and privileges of the Association, you and your Union members who are employed by Association members are hereby notified that effective 7:01 a.m. July 17, 1958, the local business establishments operated by Association members whose employes are not then on strike will be temporarily closed."

- July 17: All of the member plants were closed down. Workers were paid up-to-date when they ar-

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rived at work. Picket signs announcing "Strike" were hastily changed to read "Lockout" according to several of the producers. This the Union denied.

- August 7: Both producers and Union sat tight for almost three weeks. The mediator finally brought them together for their first post-strike meeting on August 7. In the meantime, the producers had: (1) met with local contractors, explained their position, and asked for support; (2) sent a letter to the wives of striking employes explaining the terms offered before negotiations broke down; (3) held a meeting of Association members to determine the course of negotiations in the future.
- August 13: An all-night negotiating session as held at a local hotel with little progress.
- August 15: Letter was sent to all workers describing offer made by employers at August 13 bargaining session.
- August 19: The strike collapsed, and agreement was reached on essentially the same terms offered before the strike began.

After the men reported back to work, one of the most interesting facets of the dispute arose. The striking workers had applied for unemployment compensation, claiming a lockout. Under Kentucky law, the compensation would be allowable in case of a lockout, but not in case of a strike. The state allowed the request and paid the compensation.

But the employers' Association decided to appeal this decision. Although there wasn't a great deal of money at stake, the principle and precedent were important to the employers. A hearing was held before a state referee, and he upheld the original decision. The producers then appealed to the Circuit Court in the Spring of 1959. On October 25, the Circuit Court reversed the ruling made by the state commission and found for the employers' Association.

There was no vacillation on the part of the judge who handled down the Circuit Court opinion. In remarks attached to his decision, he said wryly: "The Order of the Appellee that the unemployment was the result of a lockout instead of a strike seems to be based on the theory that if the Union cuts off the tail of industry a little at a time that industry will suffer no harm—not even suffer. In this particular instance, the corollary of that theory is that labor may cut off the caudal appendage of industry and have it too."

The Union, in turn, appealed this decision, and the case is still in the courts of Kentucky—and probably will be for another year or two.

**What lessons have been learned** from the long dispute in Louisville? I asked each of the industry disputants to suggest advice they would offer—as a result of their experiences—that might be helpful to rock producers in handling labor problems. Here is a synthesis of the major points covered by the Louisville producers—a blueprint for an intelligent and enlightened approach to negotiating and dealing with some very tough and skillful unions.

1. Band together for strength. "A producer who resists meeting the union in company with a group of other producers with like problems is really kidding himself," said one of the Louisville operators. "The unions never go backwards, and no small company can individually negotiate with them effectively. They must be met head-on by a group of producers."

"Their sources of information and advice are phenomenal," said another producer. "They get the best of everything. The average lone businessman has no such resources. Who's going to negotiate for a small company? The president? His lawyers? Chances are they aren't remotely qualified to do the job. It's become a highly specialized business, and the unions have the specialists. Management can match them only by grouping together."

To be effective, however, such a group should have all the producers in a community, or—at the very least—all the major producers. "You've got

to size up your people," says a Louisville producer. "If you have people who will stand firm and the major producers will throw in with you, by all means organize. But if even one major producer is left out of the group, you're licked. The same holds true for weak sisters. If your group includes weak links, you've got to assess them and decide how likely they are to splinter off in the midst of a crisis. The workers, themselves, provide one of the best arguments to keep faltering producers in line. During our strike, the workers complained bitterly about the Union permitting two fringe plants to operate; there will always be much pressure on the Union to prevent men in non-striking plants from capitaliizng on the distress of striking workers."

One producer summed it up succinctly like this: "No one man should try to negotiate with a Union. They platoon on you."

2. Work by committee, employing the best management talent available. The Louisville producers, meeting as a group, selected committees and qualified individuals to represent the group in a variety of functions. Five member officials were appointed by the dealers to act as a negotiating committee, and this group conducted the negotiations from beginning to end. Similarly, company legal talent was pooled and individual lawyers chosen to perform particular tasks for the group. Individual members of the negotiating committee were frequently selected to discuss particular issues. "That way," said one, "they couldn't wear us down as easily."

3. Keep the entire group well-informed during negotiations. All producers agreed that this was one of the major elements in keeping the producers united throughout the difficulties in Louisville. Frequent meetings were called to inform all of the producers of the present status of the negotiations and to seek their advice on the next steps to take. Ignorance is the greatest ally of disunity, and this was a trap that the Louisville producers avoided assiduously.

4. Select a spokesman—and let him speak. Many times during negotiations (particularly when they get sticky) and assuredly during a strike, outsiders seek authoritative information. The group should agree on how much information is to be dispensed, and on who is to dispense it. Then they should defer to their own spokesman when asked to comment individually.

"Producers should be especially careful what they tell reporters on the telephone during labor trouble," said one Louisville operator. "Reporters will call all the producers individually and magnify any differences that show up in their comments. Then they'll call the Union for comments on the management comments. And before long, the whole dispute is being tried in the newspapers with a lot of half-baked information. This sort of thing helps no one. Certainly the public should be kept informed and the facts made available to the newspapers. But this should be done by a single spokesman, chosen for that purpose."

5. Avoid retroactivity. "When negotiations are going badly," said one producer, "offering retroactive pay too freely is just a crutch to permit the Union to prolong negotiations indefinitely." During the recent negotiations in Louisville, the producers did offer retroactive pay when the contract expired without a settlement. But they carefully limited the retroactivity to 15 days, and refused to budge from this position.

6. Negotiate at a time and place permitting best results. "A businessman's thinking ability may begin to fuzz at midnight," said a Louisville negotiator. "He has probably put in a day's work before going to the negotiating session, while the Union people had nothing else on their mind. After so many hours of haranguing, a sort of mental numbness sets in. I've seen a lot of desperation contracts signed in the wee hours of the morning that never would have been signed by clear-headed people. And most of them have been highly favorable to the Unions."

The Louisville negotiators tried to keep their mornings free for business and to begin negotiating at 2 p.m. The sessions normally broke up by 4:30 or 5 in the afternoon. ("If we hadn't accomplished anything in three hours, we were better off to quit and have a fresh run at it the next day.") There were several extraordinary sessions in Louisville—and one that lasted all night. But none of the operators involved recommend this kind of high-pressure negotiation.

7. Call in a mediator only as a last resort. "The mediator in Louisville did a good and fair job," I was told, "but no matter how competent he is, a mediator should be used only as a last resort. In our case, he was notified by the Union in order that they could legally strike. Outside mediation should come only at such a raw point in the negotiations that the negotiators can no longer stand the sight

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of each other. If you're going to give in to the Union, for goodness' sake do it yourself so you'll get credit for it—and not with a mediator twisting your arm."

Several of the Louisville producers also pointed out the need to be cautious with a mediator. "Work through a spokesman," one said. "Otherwise, he'll talk to you individually and take a synthesis of the most favorable things he can get—even though they don't represent majority opinion. That's his job."

8. Keep calm. A man lets his guard down when he gets angry—and sometimes the tactics of the opposition are aimed to encourage anger. "Whenever one of us started to get really hot under the collar during the last negotiations," said one producer, "we asked for a breather, retired to a nearby room and cooled down the guy who was about to boil over."

9. Negotiate each contract item separately. The Louisville negotiators learned this one the hard way. "We thought we had agreement with the Union on a number of points," said one, "but they would renege at the next session, and we were right back where we started from. Next time, I'm going to recommend that every individual contractural point be typed on a separate sheet of paper and initialed by both parties when agreement is reached. Then we can dispose of them one at a time and get on to something else."

10. Keep the group intact at all costs. We end where we began—with a group of producers strongly united in a common purpose. When one or two waver, the whole structure threatens to topple. Strong moral suasion should be used to keep the group intact until the contract is settled.

**What kind of arguments do producers get** from dissident members of their own industry who want to back down or refuse to join a group for negotiating strength? Six appear most frequently:

—"We don't hire enough drivers to make this possible fight worthwhile to us." (What they often don't see is that when a few drivers are given an easy increase, other employes demand the same treatment.)

—Different segments of the rock products industry have little in common, and have entirely different problems. (True, to a certain extent, but they also have a good many common problems in dealing with union labor.)

—Labor problems in competing plants afford an opportunity for a quick profit for those operating in the clear. (No question about this; it must be overcome by group moral suasion.)

—Many people, even fellow producers in the rock products industries, simply don't trust each other. (Sad, but true; it can be overcome only by the sometimes long process of building mutual understanding.)

—One of the men involved in the Louisville fight said: "This isn't a business noted for its spectacular intelligence. We've got to smarten up—particularly on labor matters." (He said it; I didn't.)

—"I've got my money invested, and I've got to operate. I simply can't afford to let my equipment stand idle." (Financial instability is a tough argument to overcome—and it's all too prevalent in the rock products industries. Yet, it's remarkably shortsighted. When equipment is kept operating at any cost, the cure is often worse than the disease.)

During the numerous conversations I had with the Louisville producers, one of them may have unwittingly put his finger on a basic—and generally unrecognized—reason for the steady succession of Union victories in labor-management negotiations in recent years:

"Even when we come with a list of points we want negotiated, our list is never as long as theirs. We just don't have a vivid enough imagination."

Perhaps this is true of management in general. Perhaps—in addition to the ten negotiating suggestions offered by the Louisville producers—an eleventh might be added: "Be imaginative in union negotiations." Perhaps the best way to penetrate the obfuscation so frequently thrown up by union leaders is with inspired imagination.

"We probably could have agreed on the same contract without any strike," said one Louisville producer somberly, "but we couldn't get through the fog to offer it to them."

"We didn't lick the union," said another. "That wasn't our purpose. Our biggest accomplishment was in keeping ten individual and independent companies together in an uncomfortable and expensive situation for almost two months. It paid off—but it wasn't easy." **END**

*Editor's Note: Succeeding articles will cover the solution of rock industry labor problems in New Orleans, La., and in the state of Connecticut*

*Marquette Cement's dust-suppression system retains prime cement-making material*

# Profit control includes dust control

BEFORE AND AFTER PHOTOS of Marquette Cement Manufacturing Co.'s quarry and crushing plant at Cartersville, Ga., point up its successful effort to prevent wind from blowing profits away. Dust control, Marquette's management realized, is more than a public relations problem, a maintenance problem or a housekeeping problem. It is also a cost-control problem. Studying its cause and effects, they pondered whether to clean up the dust or collect it. Their decision? Eliminate it.

Tackling their problem at its source, they installed a dust-control system that sprays a chemical solution onto crushed limestone wherever and whenever dust is created . . . at the feed and discharge ends of the primary crusher and cuber and discharge end of the conveyor to a storage pile.

The chemical is a specially formulated, surface-active compound, much more effective than plain water. Untreated water sprayed on dusty rock forms globules and rolls off, leaving the dust free

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ABOVE: Without sprays, dust rises from the vibrating screens and cuber. When the wind is blowing from the east, dust obscures the crusher operator's view of the equipment. This forces him to cut back on the production rate or risk damage to the equipment

BELOW: With sprays, the operator's view is not bothered by dust. He can maintain a maximum feed rate without the risk of jamming the vibrating screen hopper and cuber

## PROFIT CONTROL INCLUDES DUST CONTROL

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to rise into the atmosphere. The mixture of a minute portion of the compound (one part compound to 750 parts of water) breaks down the surface tension of the water. The resultant solution spreads further, penetrates deeper and diffuses more widely. The compound is nontoxic, odorless and harmless to skin and clothing.

Mixing of the compound is done in a small pump house under the cuber. A 1-in. liquid flow proportioner, equipped with a bellows-type pump, provides the flow of surface-active compound. The spring-bellows pump meters liquids at desired volumes with an accuracy of one percent.

**A piping system distributes the solution** to four major points in the crushing operation. Two applications are made in the primary crusher. Quarried rock is hauled about ¼-mi. from the rock face in 15-ton, back-dump diesels. They dump their loads into a feeder discharging into a 42 x 48-in. jaw crusher. The first spray application is into the jaws of the crusher. The crusher operator selects these sprays by push-button controls interlocked with the feeder drive. When the feeder stops, the sprays stop automatically.

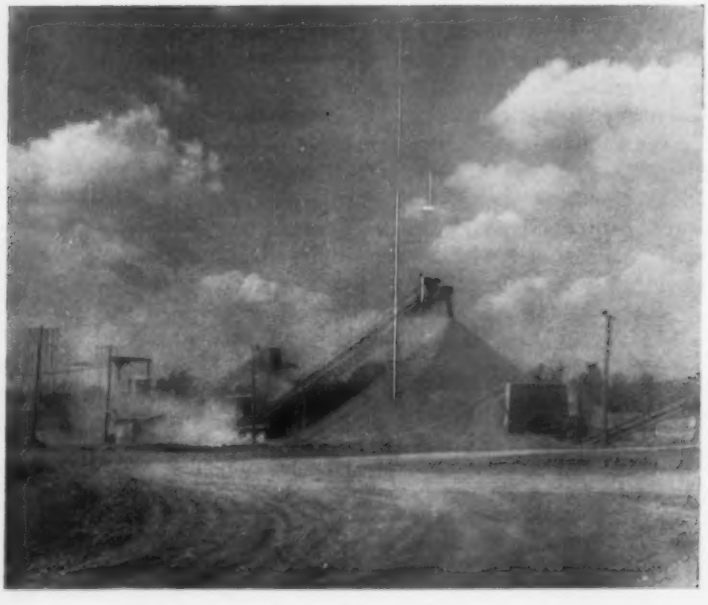
Spray jets at the discharge end of the primary crusher are actuated by an automatic control beneath the 36-in. conveyor. This control senses the depression when the belt is loaded with rock. Sprays shut off when no stone is on the belt.

**The most important applications,** as far as production is concerned, are at the mouth and discharge end of the cuber. The dust from the cuber formerly obscured the crusher operator's view of the screens and return conveyor. When this happened, he had to cut back on the feed rate to avoid overloading and jamming the screens, and possibly overloading a belt leading to a storage pile. This condition is avoided by the final application of the solution before crushed stone drops onto the surge pile.

During particularly long dry spells in Georgia, another set of sprays is used at the transfer of the 24-in. reclaim conveyor to the truck-loading conveyor. Generally, however, the treatment at the crushers has enough carry-over to make the last application unnecessary.

How profitable is dust suppression? You can say

SPRAYS ARE CONTROLLED either by interlocking with a drive or by automatic sensing devices under the conveyors. The controls are actuated by the depression of a loaded belt. As soon as the belt empties, sprays shut off automatically



BEFORE the dust suppression compound is applied, limestone dust rises into the atmosphere from the primary crusher; the cuber and conveyor discharge into the storage pile

positively that it contributes substantially to profits. In a dust-free atmosphere, the crusher operator can maintain the maximum feed rate to keep a constant load on the conveyor and screens. The screens and conveyors can be kept full to get maximum output without danger of overloading. There is now little concern about jamming the screen and cuber.

Periodic work stoppages charged to excessive dust are eliminated. When the wind was wrong and the operator's visibility was obscured, the vibrating screen hopper and cuber would be choked from overloading about once a week. When this happened, the company would lose the labor of six men for one or two hours while they went in with rakes and bars to punch the rock free and throw it out. Production of 250 to 500 tons of crushed limestone also was lost during these stoppages.

**How much material is saved by stopping wind loss?** That is hard to determine or even to "guesstimate." However, the blowing away of profits has been stopped almost entirely by the spray application. Furthermore, profits are safeguarded by the reduction in clean-up time and maintenance cost due to excess wear on parts from abrasive rock dust.

Everywhere along the line, dust problems meant lost product. No longer is there dust blowing off bottom-dump trailers that transport the crushed limestone from Cartersville to Marquette's cement plant at Rockmart. This was a public annoyance. Material loss was substantial and the losses represented prime material.

**What is the cost of the dust-control spray system?** Approximately one-half cent per ton of processed material. At Cartersville, Marquette operates the system only when the limestone is dry. Therefore, cost based on output tonnage is even less.

In solving its dust problem, Marquette has done more than achieve more efficient operation. Improved employe and public relations are real bonus factors that make a dust-control system increasingly worthwhile. END

MAJOR EQUIPMENT REFERENCE: The dust control system and liquid flow proportioner are manufactured by The Johnson-March Corporation.

FOREMAN ED NOLAN checks the operation of the conveyor load-sensing device used to control the spray on all conveyors. Rock on conveyor depresses wheel, actuating the flow control. When the conveyor is empty, wheel returns to the raised position and the sprays shut off

AFTER sprays are turned on, the atmosphere quickly clears. Only a slight amount of moisture is added to the rock; less than one percent is usually enough to take care of all the dust

*A new, flexible plant was the only way out for Springfield Sand & Gravel Co. It now can serve any market with the widest variety of high-quality specification products*

# Problem: Tough market Solution: Build a new plant

WE HAD TO BUILD A NEW PLANT to stay in business—in the face of demands for quality control." H. O. Klein proudly surveyed his and his partner's well-designed plant and summarized their former position quite simply. He and S. T. Anderson are in business now, for many years to come. They operate the Springfield Sand & Gravel Co. on the old Mechanicsburg Road, about 6 miles east of Springfield, Ill.

Market problems and high cost of operation forced the partners to take a good hard look at their old operation. The market was demanding higher specification products, and the trend was toward more fines in those products. Plant analysis showed that the material needed to meet this demand couldn't be collected—it was going out with reject.

"Actually, we watched a premium product go down the drain every day with a resulting loss of realization," Mr. Klein said in recollection. The combination of problems had to be met.

First off, after they realized a new plant was the only answer, Anderson and Klein made what they feel is an important decision: the project had to be done right. They wanted not only to eliminate current problems, but also to set themselves up for the future. So they called for engineering and design help. They wanted a full analysis of the operation from raw material to market potential.

This comparison expresses how the partners felt about it: "Anyone can build a house, but one can get a much better job if he hires an architect." And that kind of job was done at Springfield over a period of a couple of years.

The proposed plant design was finally accepted, and construction began in the spring of 1959. The old plant kept pushing out material until August. First output from the new plant came about two months later.

**Heart of the new plant** is the twin scalping-classifying tank. It allows this pit to reclaim a premium specification sand that the old plant rejected. This is one of the engineered facilities provided to eliminate former market difficulties. The operators also list these advantages that a properly designed plant has brought:

(1) Production of quality products at lower cost per unit;

(2) Flexibility sufficient to allow preparation of many products, through blending, to meet varied consumer demands;

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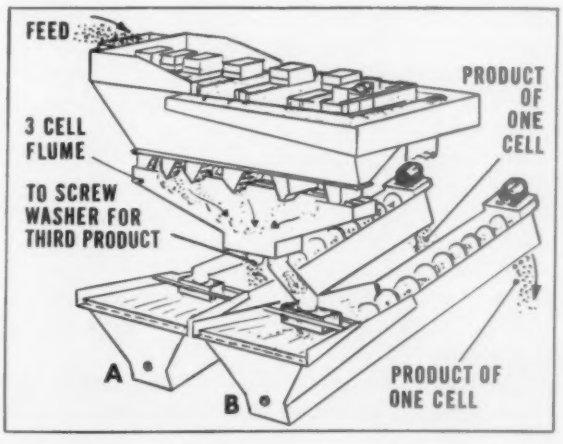


HEART OF THE PLANT: Twin scalping-classifying tank reclaims a fine-graded sand that is in great demand *(Photo, courtesy Springfield Sand & Gravel Co.)*

DIAGRAM shows collection and blending of three products from scalping-classifying tanks

## PROBLEM: TOUGH MARKET; SOLUTION: BUILD A NEW PLANT

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(3) Considerable reduction in labor requirements;

(4) Increased plant capacity;

(5) Full plant balance;

(6) Centralized control;

(7) Ability to meet increasingly stringent specifications on products for years to come.

It is with considerable pride and satisfaction that the two partners survey their success in getting at the root of their problems and bringing their solution to a successful conclusion. "The advantages gained are evident," they say, "when we study our current costs and recall the problems we used to have."

**The new plant features** complete washing, classifying and blending facilities to make four grades of gravel and three grades of sand. All can be varied to suit market demand, and all meet tough specifications. Minus 1½-in. raw material from a dredging operation is split at ⅛ in. The plus size is washed, screened and sent to stockpile as four grades of gravel. Screw-type washer-classifier-dehydrators, in series with a twin scalping-classifying tank, process the minus ⅛-in. material into three cleaned and well-graded sand sizes.

Capacity of the plant is rated at 200 tph. The plant is still in the shakedown stage, so output now averages about 175 tph. Only three men are required to operate the plant on each of two shifts daily. They include one man on the barge, one plant operator and one plant helper.

Prepared sand products move from screw-type washers to ground storage piles by belt conveyor. Area is available for storing about 70,000 tons. This is divided as follows: 38,000 tons of concrete or "torpedo" sand, 22,000 tons of mason sand and 10,000 tons of blending or "asphaltic" sand. Four sizes of gravel are washed and screened, then moved to ground storage by belt conveyor. The fine gravel size (⅜ x ¼ in., locally called sealcote) is recleaned in a screw-type washer-dehydrator before going by belt to ground storage.

**The dredging operation,** adjacent to the plant site, features the use of special equipment designed to provide constant flow of raw material to the plant with minimum labor. Only one man is needed for all material supply to the plant. Close coordination of office, plant and barge operations is vital. Thus, all points, plus the shops, are connected by an intercom system.

The deposit is workable up to 55 ft. in depth. The barge has a 12-in. nozzle that sucks raw material from the top to the full depth of the deposit by use of a solids-type pump. Feed line to the plant is 10 in. diam.

Two former problems were solved through the addition, when the new plant was built, of a hydraulic dredge agitator on the suction nozzle. Now, the suction dredge can undercut the bank so that deposit and overburden will cave properly. This makes material easier to handle and eliminates a former need to strip a few feet of overburden before dredging.

The dredge agitator, called an "agipeller," oscillates automatically at a steady rate of six to nine strokes a minute across the mouth of the suction nozzle. It has nine cutting teeth that crush boulders or hardpan strata so that stops in dredging are nearly unheard of now. The unit is bolted to the suction nozzle and is operated through a hydraulic cylinder at top pressure of 900 psi.

The hydraulic power unit is on the barge. It has a four-way solenoid valve, electric pressure switches and hydraulic shut-off and relief valves. Built-in stops on the agipeller allow the system to work constantly and automatically, so that operation needs only on-off control. The nozzle pipe is moved by a four-drum hoist. One drum and line raises and lowers it, one set pulls the barge, and two sets with lines anchored to the bank move it from side to side.

**Efficiency in plant operation** is an engineered advantage. All sizing, classifying, washing, dewatering and materials handling phases are built in through preliminary design to provide good balance in product and water flow. Once desired adjustments for product type are made and the plant is set in motion, operation is continuous. Sizes are tested periodically to check plant performance.

Dredged feed is first split at 1½ in. on a stationary inclined grizzly in the pump box at the top of the plant. Oversize, all rejected plant fines and water are piped back to the pond, in a worked-out area. Further, a primary vibrating screen splits the 1½-in. plant feed at ⅛ in. The plus size goes to the gravel section; the screen throughs and water, to the sand section.

In the gravel section, the 1½ x ¼-in. material is scrubbed and dewatered in a 36-in.-diam. x 18-ft. coarse screw washer. Processed solids are screened on a 4 x 8-ft., triple-deck vibrator into the following sizes: patching material, 1¼ x 1-in.; concrete mix, 1 x ½-in.; roofing product, ½ x ⅜-in., and sealcote, ⅜ x ¼-in. The small gravel size (seal-

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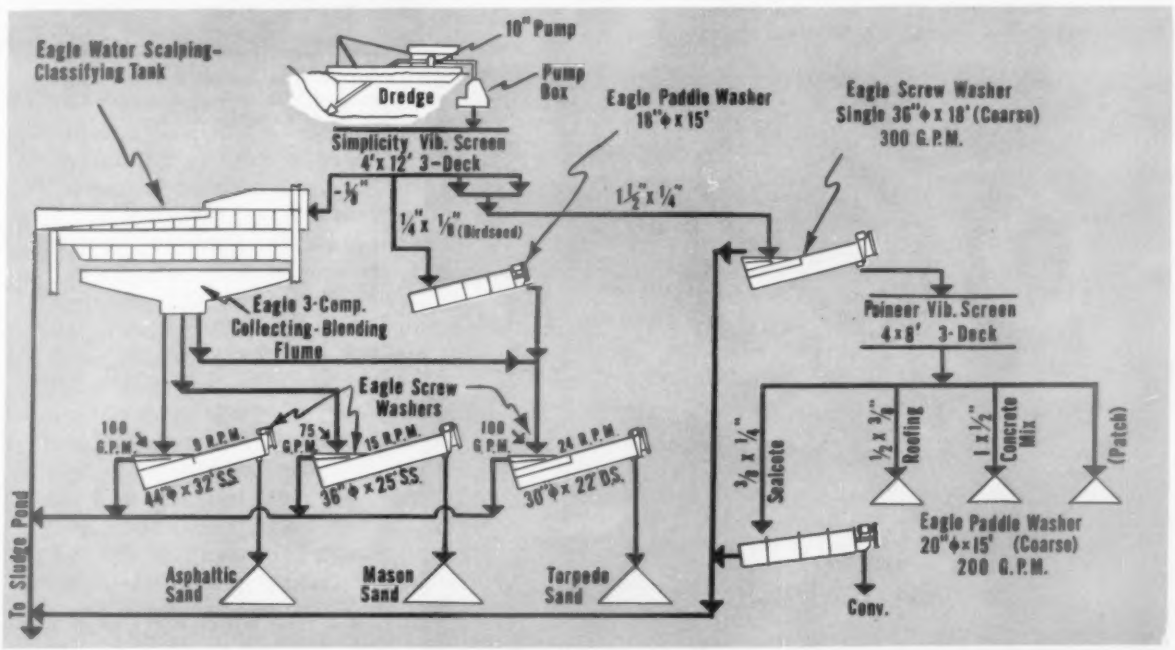
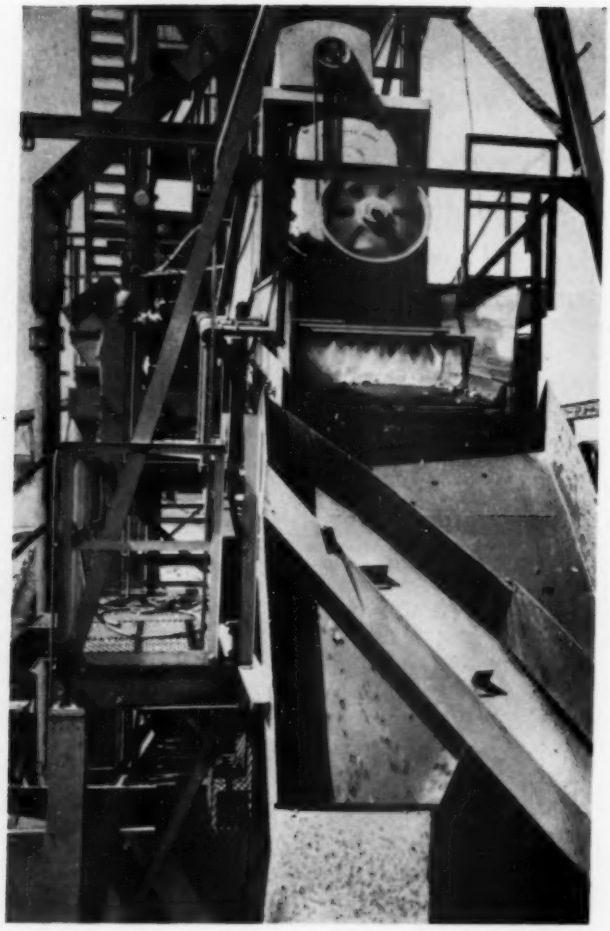
LEFT: One-man barge (plant in background); suction boom is raised to show "agipeller" attachment to suction nozzle

COST AND MARKETING ADVANTAGES came with the building of this plant





CLEANED GRAVEL is separated into four products on this screen

EACH SAND SIZE is cleaned, classified and dewatered in screw-type units

LOADING FROM STOCKS is fast for good customer service

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cote) is further processed in a 20-in. diam. x 15-ft.-long screw washer to remove contaminating material. All four gravel sizes move to ground storage piles over separate belt conveyors.

**The sand section is designed** to give "plus" benefits. Sizes processed in this section (⅛-in. x 200-mesh) represent 75 percent of total plant output. A premium blending sand is now collected here, along with well-graded and cleaned concrete and mason sand. It normally is called an asphaltic sand.

Flexibility in providing high-quality specification sands for all conceivable markets is engineered into this section. The accompanying flow diagram shows the processing route of materials through a combination of scalping-classifying and screw-type washing-classifying-dewatering equipment. The twin tank allows for production of the blending sand as well as for mason sand and concrete sand. A size (¼ x ⅛-in.) is added to concrete sand in order to blend the proper percentage of all sizes demanded by the market.

Function of the twin scalping-classifying tank is threefold: (1) It removes excess water from the system ahead of the screw washers; (2) it classifies minus ⅛-in. material into a gradation of sizes that may be distributed at will, and (3) it retains fines down to 200 mesh.

The tank is constructed to take advantage of the natural laws of settling solids. Each tank of the twin installation is fitted with nine bleeder valves at its bottom, along its length. Heaviest particles settle around the valve closest to the feed, while lighter particles settle according to size and weight into the remaining eight valves. The unit collects material down to 200 mesh, undesirable particles overflowing with waste water.

Material emitting from the nine bleeder valves at the bottom of the tank may be combined in any manner desired to produce three sizes of specification material. This is done through a three-compartment collecting-blending flume just below the scalping tank. The normal arrangement used by Springfield is: (1) Coarse material from Nos. 1, 2 and 3 tank valves is combined and added to a screw-washed ¼ x ⅛-in. "birdseed" gravel to make concrete sand. (2) Products from Nos. 4, 5 and 6 valves are collected together as mason sand. (3) Fine material from the other three valves is combined as blending sand or asphaltic sand.

Flexibility in meeting market demands, through use of this unit, is evident. Suppose, for instance, that a large customer wished more fines in a mason sand. This could be done by adding the material from No. 7 valve (normally going to blended sand) to that from valves No. 4, 5 and 6. Also, further blending may be done by mixing specified amounts from the various stockpiles, as needed.

Fresh water is added to the system through sprays on both vibrating screens and at each of the six screw washers. Two paddle washers have been added to properly clean two sizes. One was added to the ¼ x ⅛-in. (birdseed) line ahead of the 30-in. diam. screw washer that cleans and dewaters concrete sand. Another further cleans the ⅜ x ¼-in. sealcote gravel before it is stockpiled.

**The small crew** needed to operate the plant and barge gives Anderson and Klein a high productivity rate, as well as good products to satisfy the market. It averages nearly 62 tons per man-hour for all production personnel and for all material from deposit to ground storage. The plant also has facilities for electrical and equipment maintenance in adjacent buildings. Two men are assigned to this work. Four loaders operate cranes and front-end loaders that load from stockpiles into trucks. Most hauling is done by contract haulers. END

MAJOR EQUIPMENT REFERENCE

| | |
|---|---|
| **BARGE** | |
| Suction pump, 10 in., (12-in. suction | American Manganese Steel Div.<br>American Brake Shoe Co. |
| Pump motor, 300 hp. | General Electric Co. |
| Hydraulic dredge agitator and system, 12-in *Agipeller* | W. H. Pfarrer Co., Inc. |
| Dredge pipe hoist, 4-drum | King Manufacturing Co. |
| **PLANT** | |
| Plant design | Tractor & Equipment Co. |
| Vibrating screens | |
| Primary, 4 x 12 ft., 3-deck | Simplicity Engineering Co. |
| Gravel, 4 x 8 ft., 3-deck | Pioneer Engr. Works. Inc. |
| Screw washers-classifiers-dehydrators: | |
| Gravel, 36 in. x 18 ft., single | Eagle Iron Works |
| Concrete sand, Screw-paddle washer, 18 in. x 15 ft., single | Eagle Iron Works |
| Screw washer, 30 in. x 25 ft., double | Eagle Iron Works |
| Mason sand, 36 in. x 25 ft., double | Eagle Iron Works |
| Blended sand, 44 in. x 32 ft., single | Eagle Iron Works |
| Stationary grizzly, 1½-in. openings, pump box | Eagle Iron Works |
| Water scalping-classifying tanks, double, 9-hopper each | Eagle Iron Works |
| Multiple collecting-blending flume, 3-port | Eagle Iron Works |
| Conveyors, towers and chutes | Springfield Sand & Gravel Co. |
| Clear water pumps, 600-gpm., 150-ft. head, (3) | Allis-Chalmers Mfg. Co. |
| Control panel and switchgear | Westinghouse Electric Co. |
| **YARD** | |
| Truck scales, 30-ton | Winslow Government Standard Scale Works, Inc. |
| Automatic scale recorder, *Weightograph* | Fairbanks, Morse & Co. |
| Loading cranes, (2) ¾ cu. yd. | Harnischfeger Corp. |
| (1) ¾ cu. yd. | Bay City Shovels, Inc. |
| (1) ⅝ cu. yd. | Koehring Co. |
| Front-end loaders | |
| (1) H.D. 5 | Allis-Chalmers Mfg. Co. |
| (2) 1½ cu. yd. | Frank G. Hough Co. |

*Permanente Cement puts zip into Bellingham plant with new mill and shipping system*

# Bottleneck surgery rejuvenates cement plant

by Ralph S. Torgerson

NEW OWNERSHIP BRINGS SWEEPING CHANGES. Striking evidence is presented by Permanente Cement Co.'s revamping of its Bellingham, Wash., cement plant acquired in 1958 with the purchase of Olympic Portland Cement Co., Ltd. In this short time, production has jumped 44 percent and loading speed has almost tripled. Furthermore, changes are under way in the quarry to catapult production to 500 tph. from its present 200-tph. rate. Things are booming in Bellingham.

The $1.9-million modernization program began in the finish mill building, formerly a bottleneck which inhibited maximum production. By extending the building to accommodate a new 11 x 34-ft., 4,800-bbl.-pre-day mill, and taking out two older mills that together could produce only half as much, plant engineers have increased capacity from 5,700 to 8,200 bbl. of cement per day.

Barge-loading facilities were also in line for changes. Permanente has installed a welded steel pipeline and cement pumping system for barge loading at a rate of 1,000 bbl. per hour. Cement now is conveyed from silos to a barge-loading dock about a half mile from shore. This is a speedier and more streamlined operation than the former system in which railroad cars and a locomotive moved cement over a long trestle to the dock at a rate of 375 bbl. per hour.

The pipeline and pumping system has been achieved at a cost of $200,000. It will permit loading larger tonnages, so the dock will be extended 250 ft. south, and the slip has been dredged to a depth of 19 ft. below zero tide. This will accommodate barges up to 25,000-bbl. capacity.

A third project still in progress involves replacement of the present tramway haulage system at the Maple Falls quarry, the construction of two haulage tunnels totaling 550 ft. long and the conversion of the quarry to the bench system. These changes and other improvements are expected to step up raw material production from 1,650 to 5,600 tons per day.

The Bellingham plant is a wet-process operation with two kilns. Both units are relatively new —dating back to 1948 and 1958, respectively. No. 1 kiln has a chain heat recovery system and can produce 3,000 bbl. per day. No. 2 kiln, equipped with a preheater, has a daily capacity of 2,750 bbl.

When these kilns were operated at capacity, production would pile up behind the finish grinding mill. With the older equipment, finish mill capacity was about 5,700 bbl. daily. In the remodeling program, two old 50-bbl. per hour mills, installed in 1912, were taken out.

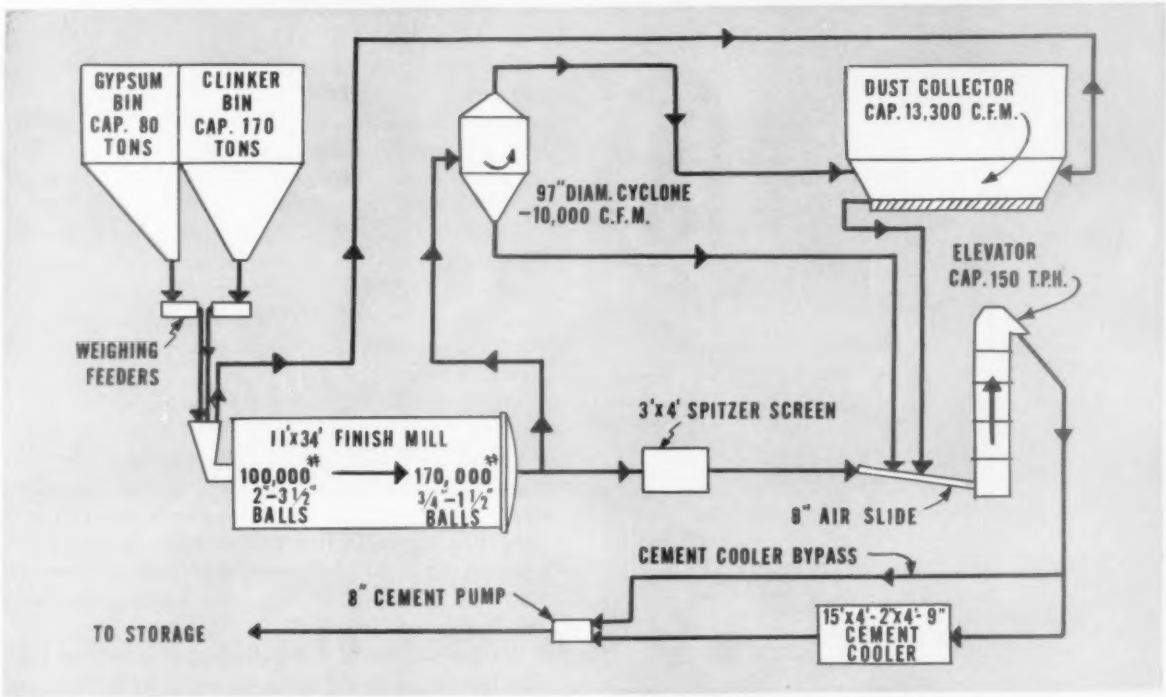
Present finish mill capacity includes the new 4,800-bbl., open-circuit, airswept mill; a closed-circuit, 3,000-bbl. ball and tube mill with air separator, and a 1,400-bbl., three-compartment, open-circuit mill. All the older mills are cooled with external spray systems, but the new mill has an internal spray system. Water is injected on the discharge side of the first compartment and its direction is the same as draft and cement flow through the mill.

**The new mill** is loaded with a total of 230,000 lb. of grinding media and is driven by a 2,000-hp. motor through a symetro drive. There is a slide shoe bearing on the feed end of the mill and a trunnion bearing on the discharge end.

The mill receives gypsum and clinker from two

*Please turn page*

A SEPARATE "INCLINING DRIVE" lets a 40-hp. motor and reducer turn the mill without damaging the big 2,000 hp. mill motor




ABOVE: Efficient flow of materials through the new 11 x 34-ft. finish mill eliminates a production bottleneck in this department

DISCHARGE END of the 12-in. pipeline is handled with a stiff-leg crane and a special flexible section of pipe

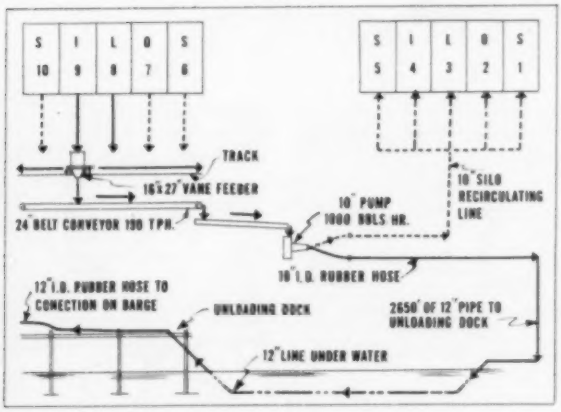
## BOTTLENECK SURGERY REJUVENATES CEMENT PLANT

*continued from page 97*

weighing and proportioning feeders. The mill and its transfer points are swept clean of coarse particles by a 6,000-cfm. dust collector after passing through a cyclone.

The finished product at the discharge end of the mill passes through a spitzer screen where large particles or tramp iron are removed. Then it moves by 8-in. airslide to a bucket elevator on its way to one of two places. It can go either to the cement cooler, or it can be by-passed and pumped directly to storage by an 8-in. cement pump. The cooler is a Permanente-designed unit.

When it is necessary to spot manholes for inspection and maintenance of the mill, "inching" is done through a shaft extension on the drive motor. A separate 40-hp. motor with gear reducer was provided for this purpose.




FLOW OF MATERIAL through the new cement handling system

A NEW $200,000 pipeline and pumping system for cement will speed up the barge loading operation

**The new pumping system** was designed to keep pace with the plant's output. Briefly, it involves use of a 10-in. cement pump to move the product from storage silos through a 12-in. pipeline to the barges. But the story of its installation is much too interesting to neglect details.

Laying of the 12-in. welded steel pipe from the plant to the dock involved its placement on piling bents. The 2,650-ft. pipeline angles down a 70-ft. bank before crossing to the barge loading point. To prevent corrosion, the pipe is wrapped with treated fabric and coated.

At the dock end, where the barges are loaded, a section of rubber hose is attached to the steel pipe. This provides flexibility in placing cement in the holds of the seagoing barges; it also accommodates variations in barge level due to tides. A stiff-leg crane supports this rubber hose; it also raises and lowers it to the barge manifold. A dust collector at the pier makes this loading operation relatively dust free.

Barge-loading is accomplished at a rate of 1,000 bbl. per hr., a speed made possible by rotary compressors operating to supply air at 4,500 cfm. and 45 psi. Electric motors with combined power of 1,050 hp. are needed to drive the three pumps and compressor.

Local shipments of cement have been stepped up with a new bulk truck-loading scale. Vehicles operating in the Seattle and Bellingham areas now will have no difficulty weighing or loading on the new scale, because it can accommodate the longest truck-and-trailer haulage units. **END**

MAJOR EQUIPMENT REFERENCE

| | |
|---|---|
| Weighing feeders (2) | Jeffrey Mfg. Co. |
| Finish mill, 11 x 34-ft. | F. L. Smidth & Co. |
| Mill motor, 2,000 hp. | Westinghouse Electric Corp. |
| Inching motor, 40 hp. | Westinghouse Electric Corp. |
| Pneumatic conveying system | Fuller Co. |
| Dust collector | Rees Blow Pipe Mfg. Co. |
| Spitzer screen | Link-Belt Co. |

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For high deposition rates, *more actual pounds laid down per hour*...for a *long lasting alloy* at a *low price* try Stoody 1030! It's available from any Stoody Dealer. Check the Yellow Pages of your phone book or write direct to the company. Literature available.

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*This segment of zoning law*
*can derail your best-laid plans for expansion*

# Watch your "nonconforming use"

by Albert W. Gray

AS A QUARRY OWNER planning to extend operations, you may be faced with "nonconforming use," a zoning problem that is growing steadily. Planning a good neighbor policy far in advance may help you, but it is no guarantee of continued success.

According to the National Sand & Gravel Association, restrictive legislation in residential areas is constantly climbing because of a rate of population expansion in the United States that is now almost two percent per year. This means that by 1975 there may be a population of 240,000,000 people in the United States. One of the effects of this enormous growth is that land use will become more concentrated. Areas that have previously been considered surburban will become urban, and areas previously considered rural will come within the boundaries of the suburbs. It is inevitable that this expansion in land use will be followed by an increasing amount of land use control.

If zoning laws have not yet been enacted in your area, or if existing laws have not been a hardship, this is an opportune time to develop an active program for emphasizing the essential economic role which your company plays in the life of the community. Such a program, undertaken before any conflict develops between your operations and zoning regulations, should enable you to make an effective case against harsh and unreasonable restrictions which might later be proposed.

**Make your company's program** for better community relations an active, well-planned one which will visibly demonstrate to your community that there is no need to restrict your operations. One man with foresight and imagination should lay out a positive program of good public relations in which all of your employes may participate. The public must be informed of the nature, problems and, especially, the necessity of your operations in

*Please turn to page 102*

TODAY this quarry is surrounded by farmland. Tomorrow it may be surrounded by residential developments and, almost overnight, become a "nonconforming use"

# KOEHRING *MEANS* HEAVY DUTY

The words "HEAVY DUTY" are an important part of the Koehring trademark . . . have been for years. And there's a mighty good reason: Koehring excavators have proved through millions of hours of service that you can count on them to outproduce and outlast other makes even under the most severe digging conditions. They're *heavy duty* through and through.

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Yes, Koehring *means* Heavy Duty. That's why you can *expect* more from a Koehring excavator . . . why you *get* more from a Koehring.

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*MORE PROFIT PER DOLLAR INVESTED*

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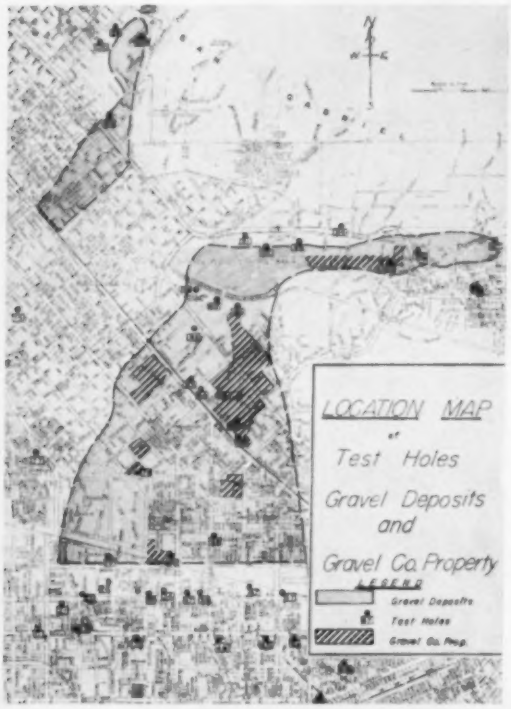
## WATCH YOUR "NONCONFORMING USE"

*continued from page 100*

the community providing construction materials at reasonable prices.

A prime consideration is your immediate neighbors, whose complaints could be the first source of difficulty, since their land value and comfort is immediately affected. Get on friendly terms with your local press, radio and television station, using every available means to communicate with your public.




Keep in mind that the basic purpose of zoning regulations is the advancement and protection of the community interest. Thus, the rights and interests of individuals and their property rights are subordinated to the welfare of the community as a whole. Your good-neighbor policy will protect your interest in the community.

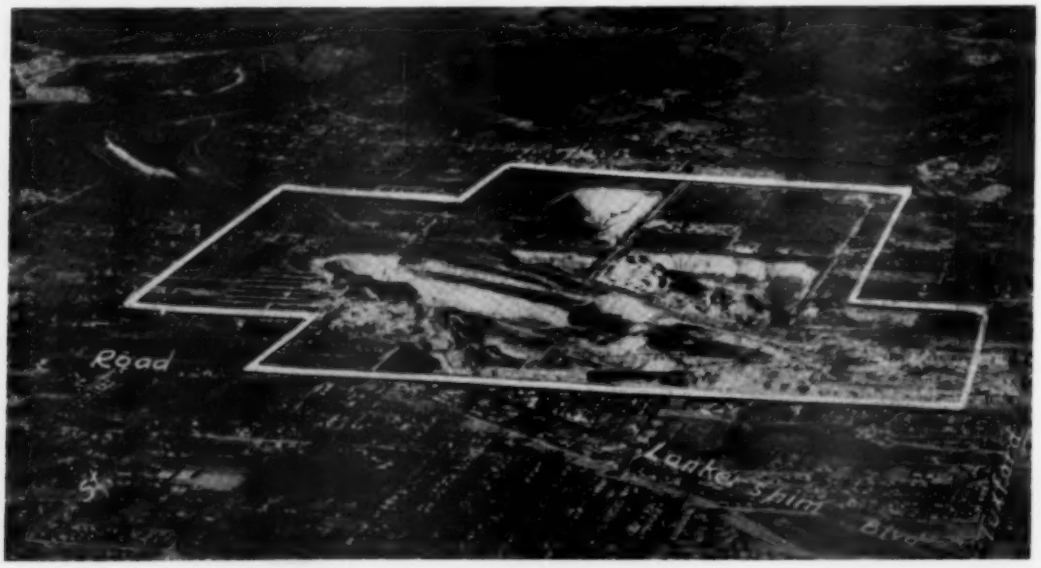
But what are your prospects with a continuing nonconforming use under zoning laws? When convicted of a violation of a New Jersey zoning ordinance, one quarry owner appealed. On appeal, the appellate court set aside his conviction.

For 40 years the quarry owner had conducted his business in this district which had been zoned as residential several years after quarry operations had been established. However, a year after the zoning ordinance had been adopted he bought an additional seven and a half acres adjoining the original plot. Five years later he directed a contractor to take the top soil along with everything on the top of the rock. The following year he began blasting the acreage. He had been convicted for the quarrying operations on this additional lot.

The town appealed from the judgment setting aside the conviction, contending that the opera-

*Please turn to page 106*

SAND AND GRAVEL PRODUCERS in California are hemmed in by encroaching cities bringing zoning problems with them



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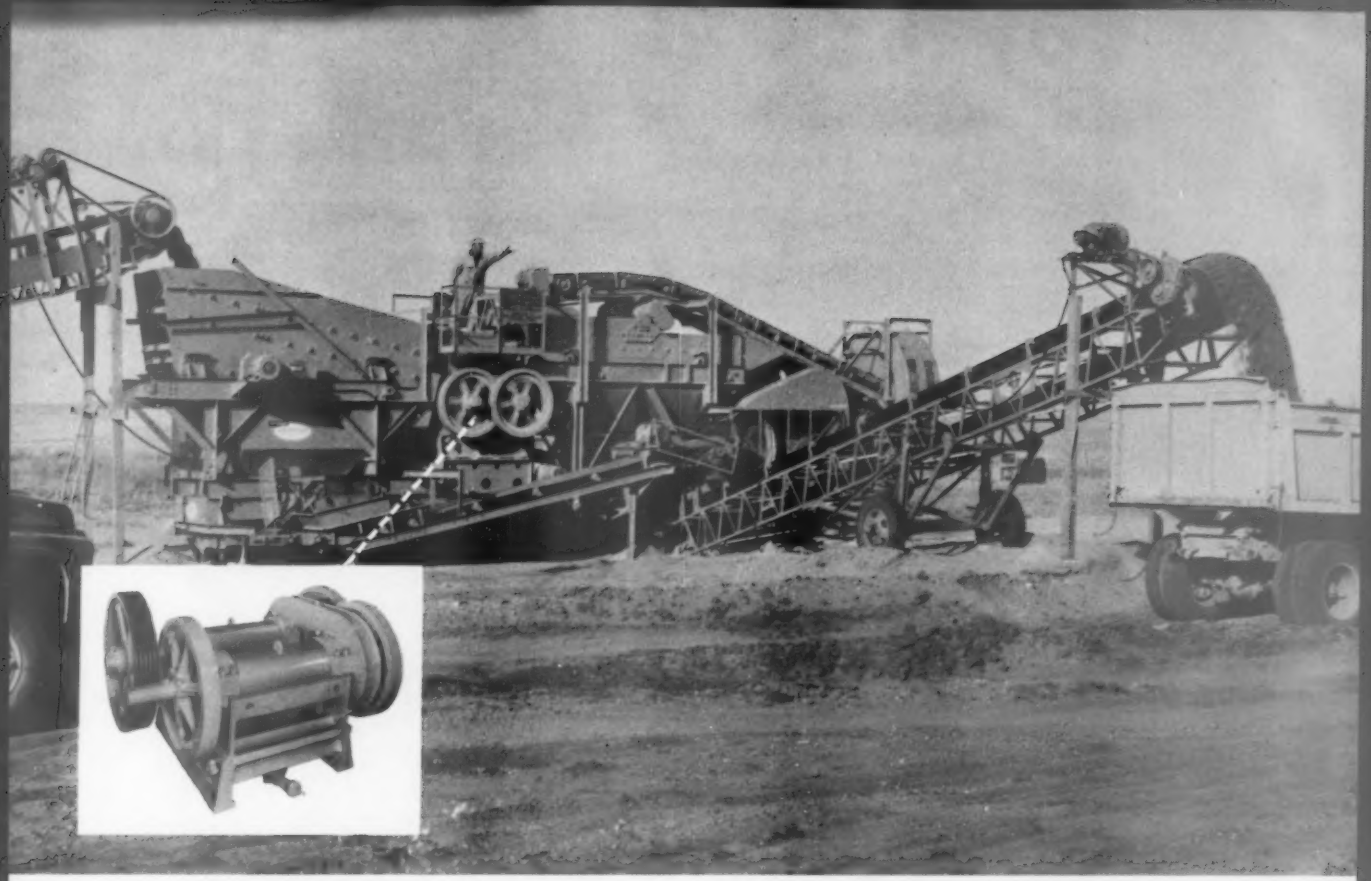

# NEW MATCHED JAW CRUSHER BOOSTS PRIMARY CAPACITY IN UNIVERSAL GRAVELKING

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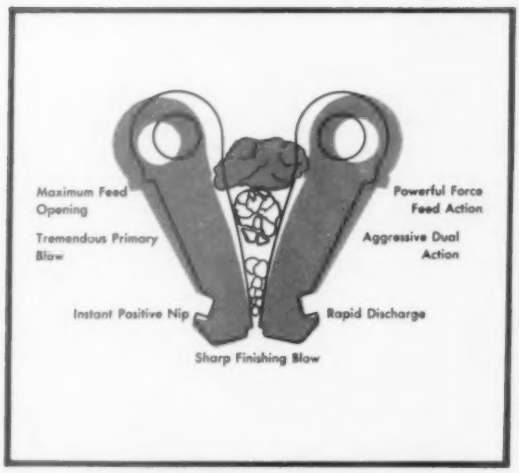


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**New Matched Jaw Crusher** with its longer jaws gives positive nip without belching. The high speed velocity crushing of two moving jaws provides forced feed and forced discharge. As a result you get primary crushing capacities never before thought possible.

**Reduces recirculating loads.** The Matched Jaws' dual crushing action with its tremendous primary blow plus sharp finishing blow assures close to finished size crushing of discharged material. This reduces recirculating loads and takes the strain off secondary equipment.

Investigate this new Matched Jaw Crusher. It could prove to be just the primary you need to boost your overall plant capacity.

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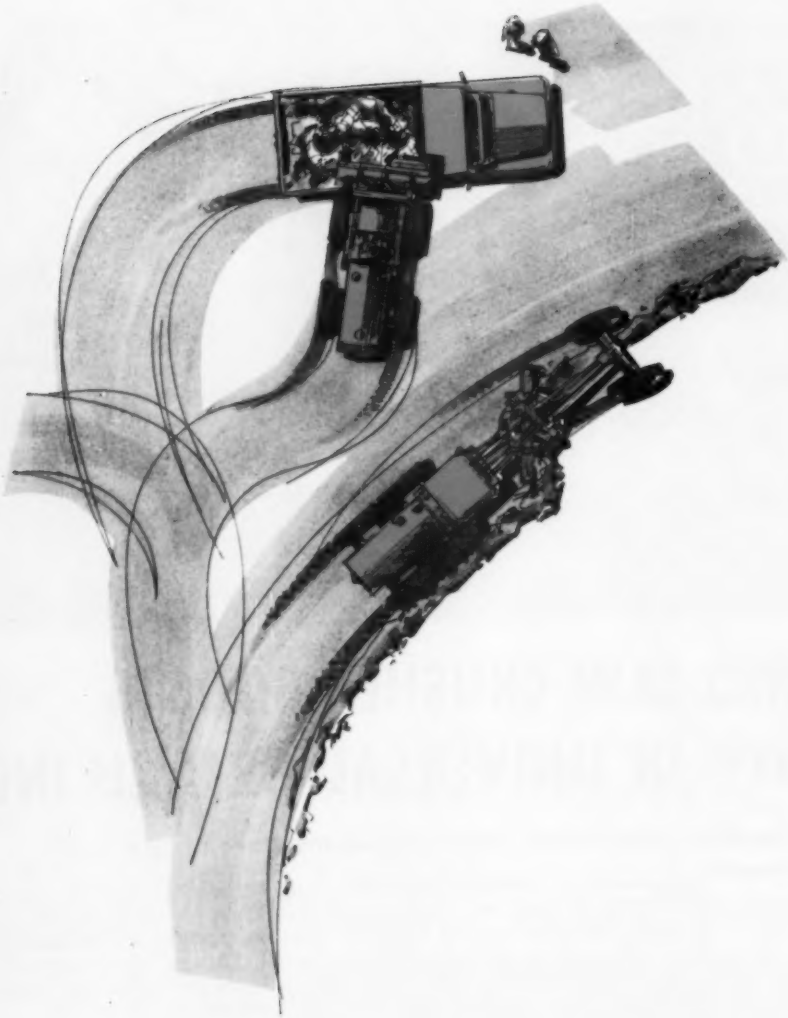

# CUMMINS C&J DIESELS 70 TO 180 HP

General Building Contractors, County and Municipal Superintendents, Construction and Mining Operators now can have Cummins C&J Diesel *dependability and economy* in a wide variety of medium capacity earthmoving equipment. This means it's easy to standardize on Cummins in graders, front-end loaders, on-highway dump trucks and the many other construction machines requiring from 70 to 180 horsepower.

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Also, Cummins C&J Construction Diesels have specialized improvements for earthmoving applications. Your engine will be equipped with a composite dry-type air cleaner, special by-pass oil filter, "bottle-stopper" type dipstick and oil filler cap, and, on supercharged and turbocharged models, a special pressurized crankcase. Only Cummins offers all of these features to minimize the entry of dirt into the engine. Positive lubrication and fuel delivery are assured in high angular operations through the use of a multi-lube pump and special oil pan.

Further, C&J engines now come supplied with Cummins new improved PT fuel system. This system, plus Cummins open-combustion chamber design and four-cycle operating principle, enables you to save as much as 25%—30% in fuel costs over engines of other designs.

More than 500 Cummins Service points are located across the United States and Canada where you can always obtain parts and service. As an added benefit, Cummins Distributors also provide job-site help through regular calls of mobile service trucks.

For more information on the efficiency and low-operating cost of Cummins C&J Diesels, see your nearest construction equipment representative or Cummins Distributor.

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## WATCH YOUR "NONCONFORMING USE"

*continued from page 102*

*Albert Woodruff Gray is a lawyer as well as a writer. A resident of Forest Hills, N.Y., he was graduated from Yale College and New York Law School. He has spent 20 years in independent practice of law, 4 years as legal watchdog for Young & Rubicam Advertising Agency and 4 years as editorial writer for Prentice-Hall Inc. He now writes free-lance articles for several business publications.*

tion of the quarry on this additional land was not an extension of right to a pre-existing nonconforming use. But even before he acquired this additional land he had been permitted by its owner to use the area. Shovels, drills, trucks and other equipment for use in the original quarry had been moved across it. Since this tract had been worked as a quarry before the ordinance had been adopted, the appellate court set aside the conviction.

To sustain that decision on the second appeal, the quarry owner cited as authority for upholding his acquittal a similar charge against the owner of a 10-acre sand and gravel plot. This plot the owner had acquired a year before the ordinance had been adopted, and when the ordinance was adopted the owner had been working but one of the 10 acres. He continued, eventually extending his operations over the other nine acres. It was held in this case that a nonconforming use of this character, if lawful when begun, was lawful if it was actively continued.

The lower court held that this tract was a unit and came within the definition of a lot. "That view we think is sound," said the court in acquitting that owner. "We think the tract as a whole was used for excavating purposes even though only a part of it was actually being dug. Under the prosecution's reasoning, the land owner would be entitled to continue a nonconforming use only on the precise spot where it was being done. We think that the tract was a single unit and that it was put to a nonconforming use as a whole before the act was passed."

The court referred then to the decision of another case in which the same defense had been interposed. At the time an ordinance had been adopted, a dwelling house in the zoned area had been used as a doctor's office, then as a tearoom. On the basis of that nonconforming use the right was claimed to adapt it to an undertaking establishment.

"We think it clear that the 'continuance of a nonconforming use' must be a continuance of the same use and not of some other kind of use."

**This principle of a continuing nonconforming use** had been recognized before by the courts in New Jersey in a controversy involving adjoining property used in the storage of lumber. Holding that such a use was preserved as a continuing use, the court there said: "Ownership without use is fatuous. True, every owner holds his property subject to the implied condition that it will not be used for the injury of others and also subject to a degree of municipal control in the interest of the common good. But if use is an attribute of property, may a municipality without making compensation, estop an owner from continuing a use that is in actuality, that was begun and continued lawfully and that becomes unlawful only because the municipality has so ordained?"

On these authorities the New Jersey court held the use by this quarry owner of the additional 10-acre tract a violation of the zoning statute and reinstated the conviction of the trial court.

"The use at the time the ordinance was adopted," it was there said in conclusion, "established the nonconforming use which this quarry owner was entitled to continue. The policy of the law is to restrict rather than to increase nonconforming uses. They may not be enlarged or radically modified. The quarrying of the 10-acre tract which added blasting and other operations to cutting and digging rock therefrom represented a substantial change from the pre-existing nonconforming use and violated the ordinance.

"The permitted continuance of a nonconforming use is the continuance of the same use and not of some other kind of use. The owner quarried the tract subject to the zoning ordinance and with full knowledge of the restrictions imposed thereunder, and it seems obvious his efforts to extend his activities into forbidden territory is in fact an attempt to circumvent the prohibition of which he was fully aware."

The cases cited above may be found in the following references: Struyk v. Samuel Braen's Sons, 85 Atl. 2d 279, New Jersey; Lamb v. McKee, 160 Atl. 563, N.J.; Kensington v. Jersey City, 191 Atl. 787, N.J.; and Durkin Lumber Co. v. Fitzsimmons, 147 Atl. 555, N.J. END

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## *New Hauling Method Drastically Reduces Operating and Maintenance Costs*

WAYNE, MICHIGAN—Gar Wood Industries, world's pioneer truck equipment firm, announces a revolutionary new bulk hauling method for any free-flowing material. Proved for the past eight years in widely diversified applications throughout the West, the method utilizes all-steel hopper trailers designed and built by Gar Wood.

Immediate and most important advantage of Gar Wood's hopper trailer method is the fact that far greater payloads can now be hauled over the nation's highways and roads. In addition, the method is much faster, less costly and there's no chance of damage or loss from spillage, weather, or contamination.

Payload increases and faster operation result from Gar Wood's exclusive Mono-Shell design which reduces tare weight, and from trailer design and mounting techniques that let Gar Wood distribute more weight over a much greater axle span. Mono-Shell hopper trailers let you increase legal payloads 23% or more per trip... even two or three tons more than other trailer methods.

If you handle free-flowing materials of any type, the Gar Wood enclosed hopper method can provide an effective way to increase payloads and increase profits. It will pay you to get a complete payload analysis from your Gar Wood distributor.

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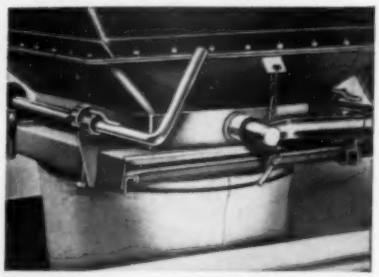
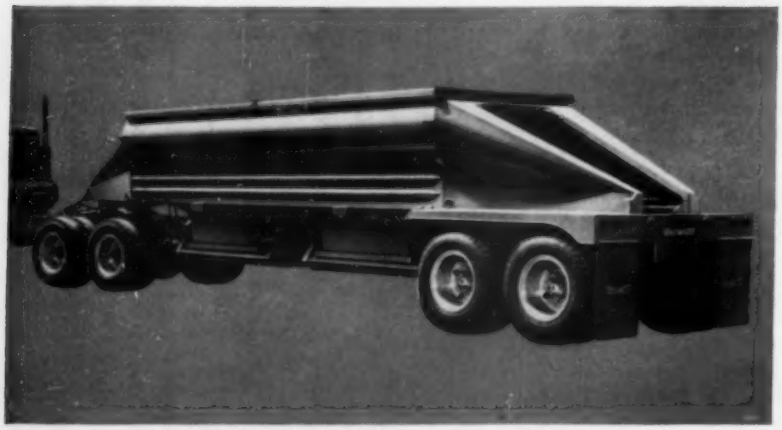
Gar Wood's patented butterfly gates seal the load completely from dirt and water. They provide fast, safe dumping for powdered and granular bulk commodities... are safe and easy to operate... virtually maintenance-free. Removable sock assembly provides full protection from wind and weather during discharge, is easily attached, removed, and can be stored in weathertight compartment during transit. Only one sock needed per train.

For complete flexibility, Gar Wood offers a split butterfly gate. It operates either as a solid butterfly for cement and other powdered materials, or will handle aggregates up to 1½-inch diameter.





Gar Wood hopper trailer models are offered as double trains, and as semi-trailers for both single- and tandem-axle tractors.

### Open Hoppers Ideal for Contractors

Contractor-type hoppers by Gar Wood are finding wide application in hauling dirt, aggregate, even hot asphalt. Hi-Tensile steel, all-welded construction makes them extra rugged. Yet light-weight Mono-Shell design means biggest legal payloads.

A complete line of discharge gates tailor Mono-Shell hoppers to your exact requirements. Gar Wood's air-powered clamshell gate has twin cylinders that close against the load. Optional cab-operated controls are widely used for fast, on-the-go dumping and windrowing.

Cable-operated door-type gate is ideal for pit dumping, plant-to-plant use and long-haul operations. Available with optional air trip or air rewind. Gar Wood also offers manually-operated clamshell gate, transverse spreader gate and rack-and-pinion gate models.

# INCREASE LEGAL PAYLOADS GRAVEL AND CEMENT

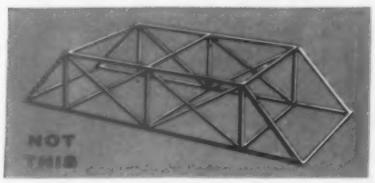
## GRAVITY UNLOADING METHOD OFFERS MANY ADVANTAGES

New Gar Wood Mono-Shell hopper trailers give you the benefit of gravity unloading, the most economical of all discharge methods. You save on first cost because there's no mechanical or pneumatic unloading equipment tacked-on to the trailer price. You save plenty on maintenance, too. Gar Wood's patented butterfly gates are virtually maintenance-free.

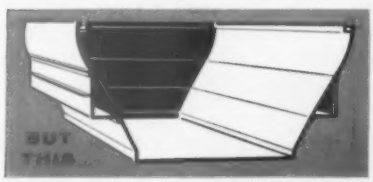
Added flexibility is another big advantage of gravity unloading. Long used by the railroads, this method is now available with high-speed, over-the-road truck equipment. You set your own delivery schedules! And, with compartmented Gar Wood models you can haul sand, cement, and aggregate all in the same unit . . . as you need them, *when* you need them.

Gar Wood's gravity unloading eliminates dead-weight mechanical or pneumatic discharge equipment . . . lets you haul 3000 to 4000 pounds *more* payload. In fact, the savings in weight alone can more than offset the cost of pit equipment.

## Mono-Shell Design Eliminates Dead Weight




Conventional design has heavy frame and cross braces that obstruct loading. Shell must still be added to this complex frame.




With Mono-Shell hopper design the contours of the body shell itself form all the required strength and support for a stronger, yet lighter body.

These models can be equipped with either permanent or removable aluminum domes. Loading hatches are fitted with vented, self-locking covers which allow free "breathing" yet keep water out. They offer complete all-weather protection for hauling cement, lime, chemicals, and other commodities.

Enclosed Gar Wood Mono-Shell hoppers are also available as semi-trailer units and can be equipped with one, two, or three discharge gates. Some models are compartmented for fast, positive cleanout and for hauling different materials on the same trip without contamination.

## *Complete Sales and Service Facilities Through Gar Wood Distributors*

Mono-Shell hopper trailers and gates are sold and serviced by the nation's largest network of experienced truck equipment specialists. These Gar Wood distributors know your local hauling problems, understand your state axle-weight laws. They can show you how Gar Wood hopper trailers are customized to give you bigger payloads, and they will assist you in arranging financing.

**FIND OUT HOW YOU CAN INCREASE YOUR PAYLOADS AND PROFITS**
**SEND FOR FREE CATALOG TODAY**

Name_____

Address_____

City_____ State_____

☐ SEND FREE LITERATURE

☐ SEND FREE PAYLOAD ANALYSIS FOR THE FOLLOWING:

Type of material hauled_____

Present type of equipment_____

Tare weight of present equipment_____

Tons hauled per trip_____

Number of hauling units_____

*Send coupon to:*
**GAR WOOD INDUSTRIES, INC.**
Customer Service Dept.
Wayne, Michigan

*Enter 1462 on Reader Card*

*Soil stabilization market for lime, still growing, is based on research. National Lime Association proposes to go the same route in building other new, large markets for lime products*

# Lime industry probes new markets

THE OUTLOOK FOR LIME MARKETS is getting brighter, even though some of them have shrunk during the past few years. Lime's newest proven market is soil stabilization, which grew by leaps and bounds during the 1950's. Success in this field, according to the lime industry and its customers, has been based on education and research. It's logical, the industry feels, to use the same tactics in looking for and developing new markets.

LIME-STABILIZED ROADS improve in strength with passing of time. Chester McDowell, Texas Highway Dept., holds a core he cut from a treated road more than a dozen years old

The National Lime Association is backing up its logic by allocating nearly 60 percent of its 1960 budget for promotion and research. It wants to look into lots of market possibilities, and some new ones look pretty good. The new oxygen process for steel making is a prime prospect for bigger lime use. Some feel that, if the industry is fortified with a technical man or group that can answer technical questions necessary to keep this use from going captive, lime use in this field could double in the next decade.

The construction field could offer a rejuvenated market for lime in this country, if we could duplicate Germany's experience. NLA's general manager, Robert S. Boynton, came back from a trip to Germany last year with a hatful of ideas. Here's one: The sand-lime-brick industry in Germany uses 850,000 tons of lime a year; if the U. S. used lime for that purpose at the same consumption rate per capita, our use would be 2½ million tons per year.

Research fellowships at the University of Illinois are producing good information that will improve present markets and build new ones. One deals with clay mineralogy, and results so far have been of great use in extending the soil stabilization market. The other deals with lime and lime-pozzolan stabilization. It's a new one and really just getting underway. The objective is to find suitable substitutes for standard materials where there is, or will be, a shortage of material. An estimated $75,000 will be spent on this project over the next five years.

The industry took time out to discuss these and many more problems at the 58th annual convention of the National Lime Association, May 23-25, Sea Island, Ga. Even though the general outlook for lime is getting brigther, all is not as rosy as it could be. Mr. Amos B. Miner of National Gypsum Co., in his report of the Project Steering Committee, cautioned that the lime industry must reduce production cost so that there will be a satisfactory return on investment for the industry. Since lime

*Please turn to page 115*

# A case history of Bemis service that could mean a lot to you

*Our principal business, of course, is to sell bags in any honorable way.*

*But we much prefer to sell them through service, such as we have had the opportunity to render over the years to General Material Company, St. Louis.*

*The General Material–Bemis case history, related chronologically here, shows some of the many ways in which Bemis is able and anxious to work with customers:*

**1952** General Material Company, a ready-mix business packaging its product under the trade name "Pree-Mix," is launched. A Bemis specialist advises the young company on bag construction and design, and assists in setting up a packing line.

**1956** General Material outgrows initial plant, constructs new plant with much greater capacity. To handle the increased output, Bemis Packaging Service representatives work with company officials and install complete Bemis packing line: Bemis Gravity Packer, Vee-Trof Conveyor and Bemis Sewing Machine Pedestal. Mr. Martin W. Melican, plant superintendent, states that "the use of the Bemis Gravity Packer has been instrumental in doubling the output of our products."

**1960** Now an established company, General Material still receives close personal attention from Bemis multiwall specialist who keeps Mr. Melican and others informed of such new developments as Bemis Extensible Multiwalls. This close personal attention is typical of Bemis service.

*This case history deals with one specialized phase of the rock products industry—but it indicates the wide range of facilities, technical skills, and packaging experience that Bemis makes available to all customers. If you would like to discuss your own packaging operation with a Bemis man, write today.*

*Where flexible packaging ideas are born*

GENERAL OFFICES 408-M PINE STREET, ST. LOUIS 2 • SALES OFFICES IN PRINCIPAL CITIES

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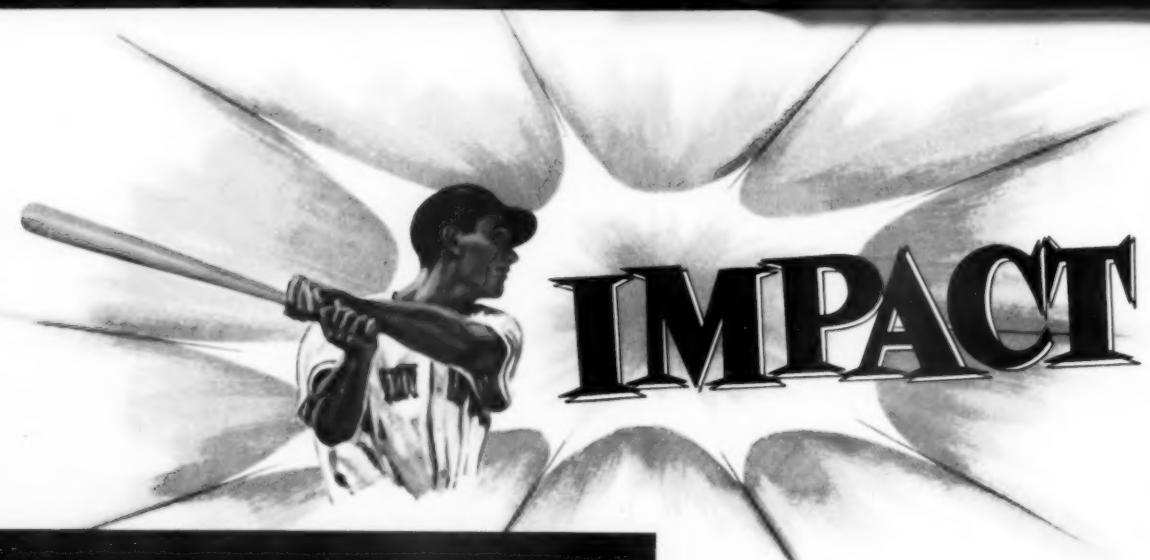


Here's the Sultan of Swat when it comes to breaking rock with scientifically engineered *impact*. A Cedarapids Double Impeller Impact Breaker gets your operation out of the bush league and into the Majors in profit. It scores with high tonnage production in every inning. It up-grades the finished product into the fine cubical shape that wins the specification pennant. With its 40 or 50 to 1 reduction-ratio batting average, there's less need for pinch hitting secondary crushers. And you'll pitch more money into the bank with a low earned run average in maintenance costs.

In the clutch, drive in the winning production run with a Cedarapids Single Impeller Impact Breaker.

## This is Cedarapids' TRUE CONTROLLED IMPACT ACTION that keeps you in the competitive ballgame!

The tremendous clout delivered by the COUNTER-rotating impellers drives the rock into deep center where it smashes into incoming rock dropping rapidly from the high angle feed. With 50% of rock breaking against rock in suspension, manganese wear is sharply reduced. The *counter* rotation of the impellers also pulls line drives right and left to the adjustable breaker bars which are strategically positioned to field the broken rock and fire the desired sizes to the discharge opening. The finished cubical specification product is the result of Cedarapids *true* impact.

# Doubles or Singles will score more productive runs when they're

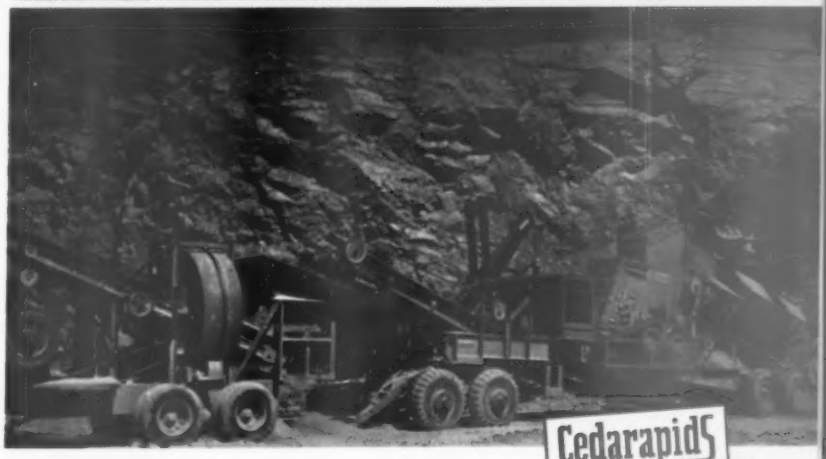
# CEDARAPIDS IMPACT BREAKERS

Cedarapids
Built by IOWA

**This Double** puts profit in scoring position. It's a Cedarapids 3645 Double Impeller Impact Breaker batting around .300 in tons per hour in this stationary plant installation. Six models give you the capacity range you need.

**A Single Impeller Impact Breaker** is as effective as a single to right field with the bases full for primary breaking or when conditions require an economical intermediate breaker between your primary and secondary. Two sizes available for portable or stationary application.

**Fast on the base paths!** It's a 100% portable Double Impeller Impact Breaker. From your first job you can streak to second, then third . . . and slide home with the profits. Two sizes, on wheels, keep you in position to score with fewer between-job delays.




**IOWA MANUFACTURING COMPANY**
**Cedar Rapids, Iowa**

INS-17

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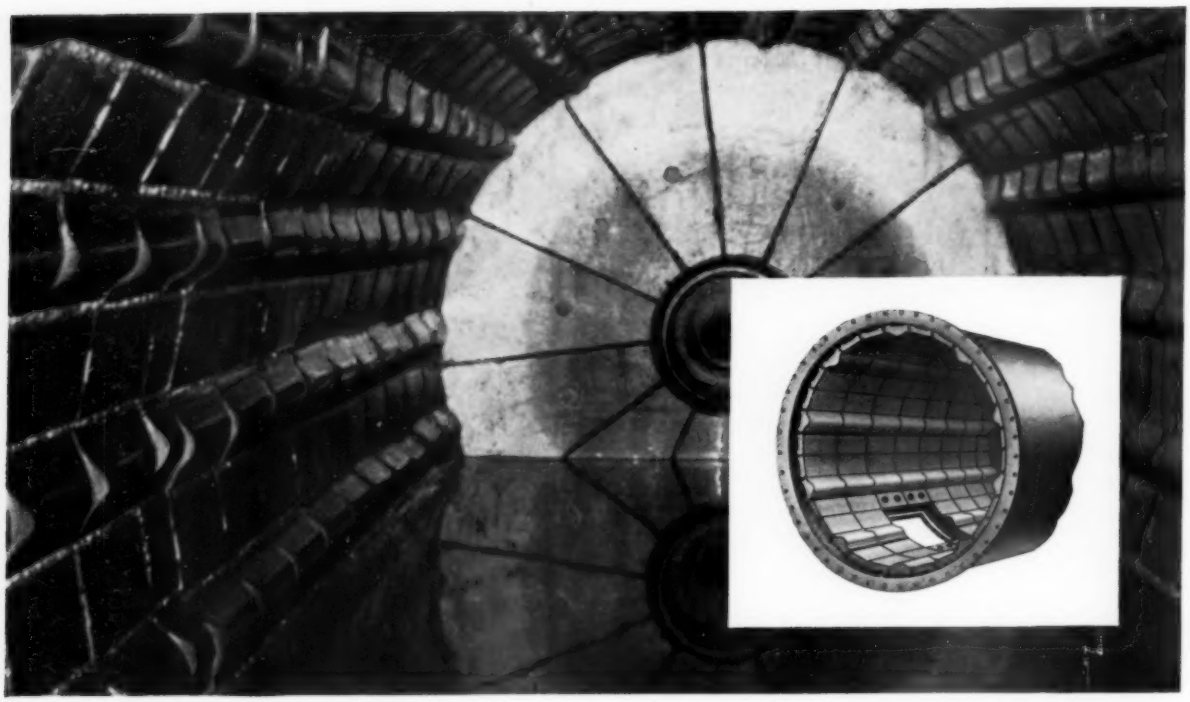

# 8 Reasons Why You Should Standardize with B&W Universal Liner Plates

### Better Performance with Lower Costs—Same Casting Fits All Mill Sizes

B&W Tube Mill Liners reduce capital, time and labor costs. Consequently, they reduce the cost of the material ground. Here are eight reasons why:

1. Lower Initial Costs—standardization eliminates chiller and pattern costs.
2. Longer Life For Liners—better quality control on a mass production casting, utilizing permanent molds, results in uniform wear. Ideal size for uniform chill and heat-treatment.
3. Longer Life for Different Applications—this is assured by selection of proper materials. Design is suitable for either chilled irons or wear steels.
4. Reduced Costs in Both Direct Labor and Outage—installation time is less because small size and weight of castings allows them to be handled easily, without cranes and with less fatigue for workers.
5. Reduces Costs in Storage Space—because small castings stack easily, little storage space is required. One design of casting interchangeable for all size mills also simplifies records.
6. Reduced Costs in Liner Inventory—standardization is possible because one design fits all diameters of mills. Standardization means quicker unloading and storage.
7. Reduced Costs on Breakage Claims and Delays for Replacements—small castings are rugged and almost impossible to break by handling. Large castings of hard, brittle irons sometimes break in shipment.
8. Reduced Costs in Determining Most Efficient Wear Patterns—you can get wear profiles consisting of all lifter ribs or all flats from the same castings, as well as a combination of both including straight or spiralled lifter pattern.

Liners are supplied in two nominal thicknesses, 1½″ and 3″ with 1½″ high lifters. Castings are 6″ wide x 12″ long. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. For additional information on B&W Universal Tube Mill Liner Plates write The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

8-471

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## LIME INDUSTRY PROBES NEW MARKETS

*continued from page 110*

PRESIDENT'S GAVEL CHANGES HANDS: M. A. Rikard (left), president of Southern Cement Co. and NLA president for four years, presents new NLA president, John M. Junkin, Warner Co., with the podium pounder

is reported as near the bottom of the list of all industries in this category, he suggested producing cost studies that could be made available to prospective producers.

The newly elected president of NLA is John M. Junkin of the Warner Co. He succeeds M. A. Rikard, president of Southern Cement Co., Div. of American-Marietta Co., who has successfully led the association for the past four years. Mr. Miner was named vice president of NLA; Mr. Boynton was renamed general manager, and Miss Georgia M. Coffman was re-elected secretary.

**Lime stabilization is not only growing** as a market in road construction, but its uses are spreading out into railroad subgrades, haul road embankments, tennis courts, building foundation subgrades and others. The process has been combined with a "ponding" technique to combat problems of expansive soils.

As explained by K. A. Gutschick, manager, technical services for NLA, the new ponding-stabilization technique involves two important phases. The first is to pond (soak) the clay subgrade for at least 30 days so that the clay swells to its maximum. (Structures built on dry, expansive soils have been damaged by swelling clay after prolonged wetting.)

The second phase of the method is to stabilize the top 6½-in. layer of clay with lime, after draining. This forms a barrier that holds moisture in the lower soil, preventing shrinking; it also dries the water-logged top portion of the clay, providing a firm working table for construction. Three such jobs have been completed successfully in Texas. Mr. Gutschick showed a color movie of a highway department warehouse job using the method. He took the film himself most professionally.

There is a growing interest in lime stabilization of road subgrades all over the country. Mr. Conard M. Kelley, NLA highway engineer, reported that 30 states are now using lime stabilization, including lime-fly ash and lime-asphalt. Specifications for such work have been adopted by 12 of those states. In the other 18, specifications have not yet been accepted because of (1) ultra-conservativeness, (2) setbacks due to initial failures or (3) politics or lack of follow-up on jobs.

But these objections are rapidly being overcome through education and research. He's learned, he said, that caution must be used on base-course construction in colder climates. Work must be done to get strength in the material before the first frost, usually by September. A breakthrough in a conservative eastern state was made when highway engineers witnessed the effective use of lime in "making a road out of mud."

Technical knowledge from the research fellowships at the University of Illinois has been helpful in causing the lime stabilization market to grow. After living with that work for five years, Mr. Kelley feels that the progress made is only the real beginning of lime stabilization in this country.

**A real proponent of lime stabilization** is Chester McDowell of the Texas Highway Department. Apparently he had faith in the method a long time ago. He spoke to NLA 12 years ago, saying that it would not be unreasonable at some future time that his department would use more than 100,000 tons of lime a year for lime stabilization. This year he reported a 1959 use of 121,000 tons. In fact, lime stabilization in Texas has increased 20-fold during the past four years.

This fantastic growth of the method in his state has resulted from "a cooperative effort of contractors, engineers, NLA and others," he said. Since efficiency of the method depends much on design and construction, Mr. McDowell urged that now is not the time to relax, but to give more attention to those phases of the process. He pointed out that,

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*continued from page 115*

in Texas, present letting quantities show an increase in the use of lime in spite of a decrease in lettings. "Interest of engineers and contractors in old roads indicates that lime stabilization is here to stay," he reported.

Research is developing some interesting and helpful information on the reaction of lime and soils. "It is nothing but a silica reaction," said James L. Eades, NLA research fellow at the University of Illinois. He is just getting underway with his project, and reported on the second year of the 3-yr. program.

Mr. Eades is studying the reaction of hydrated limes and soils. He hopes to provide NLA with data that can be shown to highway and other engineers all over the country, to indicate how reactions take place. The first phase of his work was to collect data on three main groups of soils including eight different kinds of clays. These were studied and charted by use of X-ray analysis. So far, all soils showed beneficial results when treated with lime, even though some soils took more lime than others.

The second phase of his investigation deals with reaction of lime and soils with regard to lime stabilization. He has studied samples taken from New York to California of treated soils that showed both good and bad results. His object is to find out what the problems are and what to do about them. Much more work of value to the association is anticipated in this field.

National Lime Association

Certificate of Achievement in Safety

The Thousand Day Club Of The Lime Industry

This Certificate is awarded to the

Hannibal Plant of Marblehead Lime Company

For having operated safely without a lost-time injury to any employee during a period of one thousand days or more from January 2, 1957 In commemoration of this achievement, the National Lime Association, cooperating with the United States Bureau of Mines, has awarded this Certificate of special honor.

LIME

General Manager

Nov. 23, 1960

Washington, D. C.

**1,000-Day Safety Club**

CERTIFICATES OF ACHIEVEMENT IN SAFETY, like the above, went to five lime plants this year. They were presented by the National Lime Association at its 58th Annual Meeting, May 23-25, Sea Island, Ga.

The Thousand-Day Club is open to all lime plants enrolled in the annual lime plant safety competition sponsored by NLA and conducted by the U. S. Bureau of Mines. Only 20 such certificates have been awarded in the industry since the Club's inception in May, 1937.

This year's winners are:

Standard Lime & Cement Co., Div. of American-Marietta Co., Pleasant Gap, Pa., plant (record ended in March, 1960, at 1,253 days).

Standard Lime & Cement Co., Div. of American-Marietta Co., Knoxville, Tenn., plant (reached 1,000 days on May 3, 1960).

U. S. Gypsum Co., Genoa, Ohio, plant (passed 1,000 days on April 6, 1960).

Marblehead Lime Co., Div. of Material Service Corp., Hannibal, Mo., plant (record ended in February, 1960 at 1,129 days).

Marblehead Lime Co., Div. of Material Service Corp., Quincy, Ill., plant (passed 1,000 days on March 5, 1960).

Mr. Eades is just getting underway with his project, and reported on the second year of the 3-yr. program.

**Lime-pozzolan mixtures can be effective** if prepared properly, based on laboratory tests, according to Prof. George Hollon, University of Illinois. He reported work of the NLA fellowship on lime and lime-pozzolan stabilization. This work is new, since the association sponsored the project only last year. It is no duplication of the work Mr. Eades is doing, since it concerns problems in application while Eades' is chemical.

Future work of Prof. Hollon will include the testing of lime-pozzolan mixes on a 7-ft. circular test track and comparing the results with standard crushed stone mixes. Later, he expects to test lime stabilization, since the test track includes a 3-ft. section of subgrade soil.

**New possibilities for use of lime in steel making** have come through the revolutionary approaches to industry producing methods. Mr. R. E. Edwards of Jones & Laughlin Steel Corp. traced the history of processes in the industry and described three new ones that involve the use of oxygen. They are: the Kaldo process at Stora Koppraberg in Sweden, the Rotor furnace at Oberhausen in Western Germany and the "L. D." process in Austria. The latter is the most popular. No less than 65 "L. D." furnaces (14-million ingot tons anually) were in operation, being built or licensed throughout the world at the end of 1959. Mr. Edwards said that

*Please turn to page 122*

# NOW...full-time analysis of materials in actual production

XEG X-Ray Emission Gage watches and measures up to 5 selected elements

**Solids, powders, slurries, fluids** — General Electric XEG X-Ray Emission Gage examines them as they actually move through production . . . writes a running record of their elemental make-up. XEG tirelessly surveys up to five elements simultaneously, continuously . . . senses both their *presence* and *quantity*. Where practical to operate minus reference, even analyzes a sixth element.

Versatile XEG serves equally well for on-line process control or individual-sample analysis. Scientifically trained operator is not required — because once set for specific analysis, there's little need for further adjustment. XEG then automatically delivers the facts on composition for rapid-fire, continuous feedback to process control.

Applications are as limitless as your imagination. And, whenever you like, we can explore XEG potentials with you. The details are available now from your G-E x-ray representative. Or write us at General Electric Company, X-Ray Department, Milwaukee 1, Wisconsin, for Pub. RP-74.

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

*Enter 1417 on Reader Card*

Michigan Dozer operator has excellent view of blade.

# High-speed Michigan Dozer expands

## *Nevada firm reduces handling costs 25%*

Nacon Company, Inc is a Las Vegas firm that *doesn't* take chances when buying equipment. "Gambling belongs in the casinos!" says Tom Stewart, president of Nacon. "Before *we* lay out $50,000 or so for any big dozer, we *demand* on-the-job demonstrations.

"Our latest demonstration really proved profitable. In the hopes of boosting crusher-feed production, we tried a rubber-tired Michigan Dozer. The output of this rig really surprised us. Tests showed the 375 hp Model 380 could push enough material to our crusher to produce 400 tons of spec stone per hour—*even at distances up to 400 feet*. No competitively-priced rig came close to this production. We talked it over with our Michigan Distributor, Graid Equipment Company . . . and bought!"

The Michigan's first job was on a 9-mile excavating-grading-structures section of new four-lane blacktop Federal Interstate Highway near Las Vegas. Here, Nacon's contract called for several hundred thousand tons of roadway base and sub-base gravel (3,250 lb/yd) in three grades—select bankrun, #1 and #2 stone. Michigan's share was to dig out and push all this material to the crusher. It did . . . at an *average* work speed of 3 to 7 mph!

### Production up 20 to 30%

Output averaged 400 tons per hour . . . 20 to 30% higher than Nacon's estimates with other machines . . . at a per-ton cost "about 25% lower." And since the high-speed Michigan could economically work longer distances, Nacon didn't have to move the crusher as often as with crawler-feeding. One set-up handles as much as 315,000 tons.

Bud Jacobsen, operator of the Model 380, likes the Michigan for more reasons than high production. "For one thing, it's easier riding," says Bud. "Tires absorb bumps and ruts so you can work faster on rough going. Second, you sit higher . . . have a better view of blade and of ledge and hopper edges. Third, Michigan handles easier . . . you change speeds and direction simply by moving little hydraulic levers *and without foot-clutching*. Its ease of handling, plus greater speed, adds up to *greater production than any crawler at any distance over 50 ft!*"

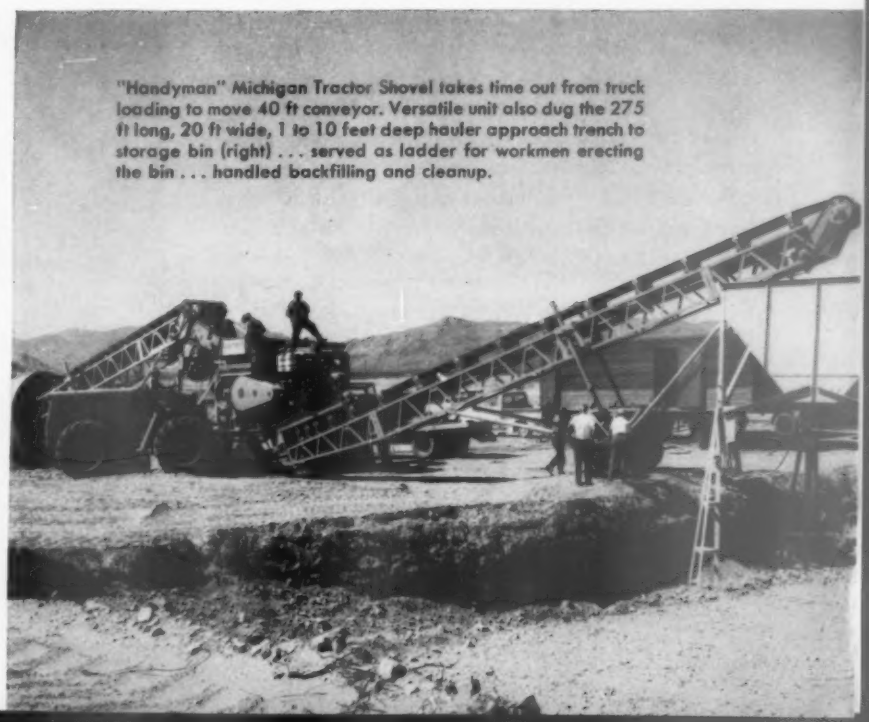
### Michigan Tractor Shovel loads 20 yd trucks in 2½ minutes

But the Model 380 Dozer isn't the only Michigan drawing praise around Nacon's crushing set-up. A 2¾ yd Model 175A Tractor Shovel is attracting attention as

# practical crusher feed distance to 400′

it handles stockpile loading. This unit heaps a typical 20 ton truck in only 5 passes, 2½ minutes . . . a typical 20 ton bottom-dump hauler in 4 passes, 2 minutes.

Output like this, day in and day out, speaks well of Nacon's job planning . . . also proves Michigans have what it takes to speed dozing and loading. See for yourself! Pick the rubber-tired Michigan Dozer you want to see, 162, 262, 375, or 600 hp . . . or the Michigan Tractor Shovel, 16 cubic feet to 6 cubic yards (standard SAE-rated capacity) . . . then ask your Michigan Distributor for a demonstration.



"Handyman" Michigan Tractor Shovel takes time out from truck loading to move 40 ft conveyor. Versatile unit also dug the 275 ft long, 20 ft wide, 1 to 10 feet deep hauler approach trench to storage bin (right) . . . served as ladder for workmen erecting the bin . . . handled backfilling and cleanup.

Michigan is a registered trademark of

**CLARK EQUIPMENT COMPANY**
**Construction Machinery Division**

CLARK EQUIPMENT

2481 Pipestone Road
Benton Harbor 31, Michigan

In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

*How progressive Indiana quarry has kept pace with rising production demands . . .*

# 4-yard Tractor Shovel slices semi & tandem load time 75%

### Original problem: Too-slow loaders

Like many quarries, Meshberger Stone Company, Columbus, Indiana, used to handle stockpile loading with power shovels and bucket loaders. Worked okay . . . *until* 1955 when the company started selling more grades of stone. Then—because these rigs couldn't move fast—*or* load fast—production suffered. Trucks were delayed, output goals unattained.

### Two-year solution: Greater loading speed

Into this situation moved a rubber-tired Tractor Shovel—with the same advantages owner Leon Meshberger found had already helped some 20 other nearby quarries. The new machine was a 2¼ yd Michigan Model 175A. *It cut load time in half*—two minutes for a typical 9 ton truck. And, by traveling between stockpiles at high speeds, it virtually eliminated truck waiting time.

### Today's solution: Still more speed

The 2¼ Michigan served Meshberger well until last year when the picture changed again. On one hand, demand went up so much, plant capacity was increased. Two, fleet owners had found it cheaper to haul in bigger

haul units. Again Meshberger sought a way to cut load time. His move was a natural one: to a still larger Michigan . . . this then-newly-introduced 4 yard Model 275A.

## 4 yards per pass

Loading capacity of this new Michigan has proved all that was expected—and more! Fifteen ton tandems now need only 3 passes, 45 to 90 seconds, to load. Twenty-two ton semis are heaped in only 4 to 5 passes, 2 minutes. Load time is two-thirds that of the Model 175A . . . one-fourth that of bucket loaders!

## Material: ag lime to 6″ stone

Loading of all 15 crushed grades is ably handled by the 262 hp Model 275A: from ag lime (above) to 6″ stone—over 400 tons an hour. In readily-heaping powdery lime, bucket loads often weigh 8 tons each. In coarse stone they average 5½ tons each.

## Loads small trucks effectively, too

Material goes into many different kinds of haulers, pickups to trailers. The 4 yard Model 275A handles them all. On smaller sizes, like this 6 ton dump truck, Michigan operator Verne Fawbush merely lets bucket extend over rear of truck bed toward stockpile. This way, most of the excess material from the one or two passes falls back on the stockpile; balance is cleaned by one quick swipe of the bucket.

## "Good job" in shot rock

At times, the 4 yd Michigan helps out in the pit. Power, size, and reach are ample to feed the 15 ton rock wagons. Despite absence of rock bucket, unit does "good dependable job" lifting the heavy, jagged ledge material and carrying it over rough footing to the trucks.

## The future:

Speed and capacity of his 4-yd Model 275A Michigan "should handle our expansion for years to come," forecasts Mr. Meshberger. But should things boom unexpectedly, the next step is here! Michigan's biggest model —*the 6 yard 375A*—is already being used in many pits! Could its 6 yard (or the 275A's 4 yard) "bites" help solve your production problems?

Michigan is a registered trade-mark of

CLARK® EQUIPMENT

**CLARK EQUIPMENT COMPANY**
Construction Machinery Division
2481 Pipestone Road
Benton Harbor 11, Michigan
In Canada: Canadian Clark, Ltd.,
St. Thomas, Ontario

*continued from page 116*

CONVENTION SPEAKERS PLUG LIME: (left to right) J. C. Harper, traffic consultant, Fleming-Harper Co.; Prof. George Hollon, Civil Engineering Dept., University of Illinois; James L. Eades, NLA Research Fellow, University of Illinois, and James F. Crist, vice president, The Southern Co.

both number of furnaces and capacity will increase rapidly.

Of interest to the lime industry is the fact that from 100 to 175 lb. of lime are used as fluxing agent for each ton of ingot produced in the oxygen steelmaking methods. Based on data collected on an 82-ton heat produced at one of his company's plants, consumption of lime would be from 5½ to 9¼ tons of lime per hour, depending upon the ratio of lime used.

The future outlook for the growth of the oxygen process—the greater use of lime—is bright for two important reasons. They are: (1) increased productivity rate—138 tph. were produced with the oxygen method, compared to 20 tph. with the regular open-hearth method; (2) the capital investment required for the oxygen process is about ⅓ of that needed for an open-hearth furnace.

**Promotion of lime** is a large and important activity of NLA. Most of the association's budget is spent for that purpose. "We've got to keep the public thinking about lime," reported Mr. Boynton in his annual report, "and we know we're getting results."

Most promotional activities have been on lime stabilization, but Mr. Boynton recounted nearly a dozen additional "more obscure, unsung" promotional activities regularly carried on by NLA. His review included these: (1) 17 addresses before engineering groups; (2) movie showings—50 requests for movies on lime stabilization last year, 27 prints sold, nine to countries out of this hemisphere; (3) many publicity articles, 90 percent of them written by NLA staff; (4) three new publications issued in 1959, and (5) new color movie on masonry mortar underway, ready by this time next year.

**Safety records continue to be broken** in the lime industry. In 1959 there were 22 plants that completed the year with no lost-time accidents, a new record. There were 15 in 1958, and the highest previous number was 17 in 1956. According to Mr. Gutschick of NLA, 1960 may see the record broken again, since 36 plants had unblemished records for the first quarter.

Special recognition went to multiplant companies with perfect records in 1959; Marblehead Lime Co. (5 plants, also injury free in 1958); Standard Lime & Cement Co. (4 plants); U. S. Gypsum Co. (3 plants), and Ash Grove Lime & Portland Cement Co. (2 plants). More spectacular is the record for long-time safety in plants. Just recently, five lime plants passed the 1,000-day mark with no lost-time accidents. Only 20 plants have reached that goal, through 1959, since May 1937. The five plants receiving the NLA 1,000-Day Certificate in 1960 are listed elsewhere.

Traffic problems continue to plague the lime industry, and NLA set up a special committee in 1958 to watch and work on those problems for members. The initial report of the committee was prepared by Mr. R. C. Berrey. In his absence, it was given by Mr. J. C. Harper, traffic consultant.

Mr. Berrey's report reviewed the areas of activity of the committee and work done at two meetings. One was in Washington, D.C., during October 1958, and the other in Chicago, Ill., in August of 1959. The report included a resume of Mr. Boynton's testimony at a meeting with eastern division railroads on revision of freight rate scales. Mr. Boynton said, in that meeting, that the increase in the freight rate of lime since World War II was much greater than on competitive products.

Personal remarks by Mr. Harper on the committee and its work were to the point. He suggested that formation of the committee on traffic exhibited progress, since there had been relatively none for lime prior to that action. "Are traffic rates important to you?" he asked. He answered his own question with a statement that 40 percent of the delivered price of lime in the South is represented by those rates.

The subject merits not only the attention of

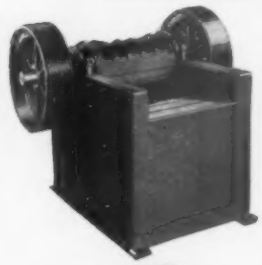
*Please turn to page 132*

# For men who like to underbid their competitors

**(and make a nice profit, too!)**

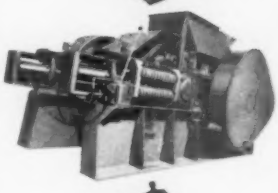
### JAW CRUSHERS

PIONEER overhead eccentric action offers double action crushing stroke, thus providing forced feed and greater capacity. Shaft bearings placed closer than on any other crusher. Double-walled, welded steel base reduces weight at the same time it increases strength. Reversible jaw plates. Available in 10 sizes from 1016 to 4248.



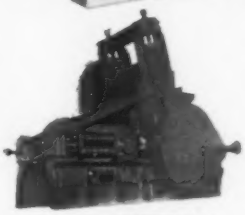
### TWIN ROLL CRUSHER

PIONEER design makes 100% of roll shell available as crushing surface. Hydraulic adjustment simplifies setting crusher to meet product size. Shells are easily replaced without removing bearings from shaft. Driven by star gears, completely enclosed and running in oil. 2416, 3018, 3024, 4022, 4030, and 5424 sizes.



### TRIPLE ROLL CRUSHER

Add a third roll and you have a triple roll crusher. This makes it possible to increase stage of reduction to as much as 6½". The Triple Roll Crusher is manufactured only by PIONEER. Available in 3018, 4022, 5424 sizes.



### IMPACT BREAKER

The PIONEER 3648 Cuber is a multi-stage, regulated-flow impact breaker suitable for either primary or secondary crushing of relatively non-abrasive stone. Full gradation control. Capacity up to 150 tph of minus 1"; up to 350 tph of minus 3".

### APRON FEEDERS

Heavy-duty PIONEER Apron Feeders have ⅛" thick, overlapping, forged steel pans carried on heavy chains supported on wide heavy duty rollers. Available with or without straight or flared sideboards. Widths 30", 36", 42", 48". Lengths 6', 8', 10', 12', 14' and larger.

### PORTABLE APRON FEEDERS

Mounted on pneumatic-tired chassis. Used in place of conveyor for feeding heavy, sharp, abrasive rock to portable primary crushing plant. Easily detached for quick job-to-job moves. Available in two sizes: 36" x 30' and 42" x 30'.

### PIONEER ORO FEEDERS

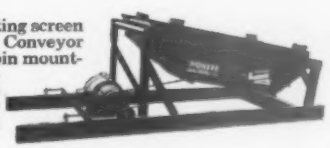
The most rugged feeder made. Pans, rollers, drive sprockets and idlers cast from special high alloyed manganese steel. Pans are from 9/16" to 1" thick, depending on width of feeder. Chain links are cast as part of pan so there are no bolts or rivets to break or loosen. Available in 30", 36", 42", 48", 60", 72", 84" widths.

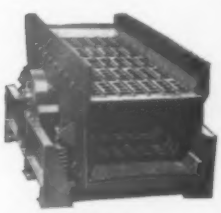
### MECHANICAL FEEDERS

PIONEER Reciprocating Plate Feeders provide uniform flow of material to conveyors. Available in five different models.

### BUZZER SCREEN

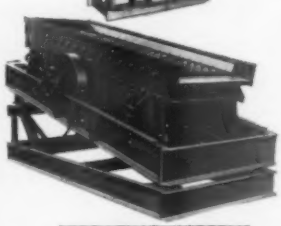
This small, compact vibrating screen fits on PIONEER Portable Conveyor and is also available with bin mounting. 3' x 6' size for production of ¾" material up to 50 tph; 4' x 8' size for production of ¾" material up to 90 tph.





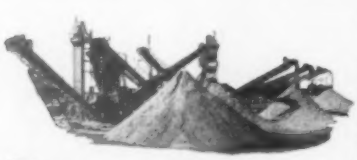
### MESABI SCREEN

This heavy-duty vibrating screen withstands heaviest loads. Frame is 18" car channel on I-beams reinforced with 8" wide flange beams. Pans are ¾" or ½" thick. Four bearing, heavy duty shaft. Seven sizes from 4' x 10' to 6' x 14'.



### VIBRATING SCREENS

PIONEER's full-circle throw gives same positive down-hill vibration at each end as in middle, thus every square inch works for you. Exclusive secondary spring suspension mounting effectively confines vibration to pan. 2 and 3 deck screens in 11 sizes.



### CONVEYORS

Available in 18", 24", 30", 36", and 42" widths. Easy-to-erect *pre-engineered conveyors* range in length from 30' to 120' in 5' increments. *Job-engineered conveyors* for horizontal, extra long, or other special installations are available in any length from 12' up.

### PORTABLE CONVEYORS

On hydraulic cradle truck for easy portability and one-man operation. A 70' conveyor is easily raised to operating position in 9 minutes, lowered in 1 minute. Available in 18", 24", 30", 36" widths; in 40', 50', 60', 70' lengths.

For further information on any of the equipment described on this page or on PIONEER Portable Crushing and Screening Plants, Washing Plants, Bituminous Mixing Plants, *VIBROmatic* Bituminous Pavers, Conveyor Towers and Supports, Rock Ladders, Bins and other PIONEER Equipment, write or call Pioneer Engineering, Division of Poor & Company, Inc., Minneapolis 14, Minnesota or your PIONEER Distributor.

**Pioneer**
**EQUIPMENT**

*Enter 1442 on Reader Card*

Part 3**

*Lehigh's Miami plant electrical layout assures safety for men and big machinery in water-logged coral limestone*

# How to ground quarry equipment

by John F. Hower* & Anthony C. Lordi†

POWER CENTERS CHOSEN FOR THE MIAMI PLANT were 750 kva. or smaller. Where an operating department requires additional capacity, there is an additional power center or a double-ended arrangement. They operate with a normally open tie breaker to keep short-circuit currents within standard control center requirements. All 750-kva. power center transformers are designed for the future addition of fans to extend their rating to 862 kva. These power centers are fed radially from the 5-kv. metalclad air circuit breakers. Critical loads are fed with multiple cables for an additional degree of reliability.

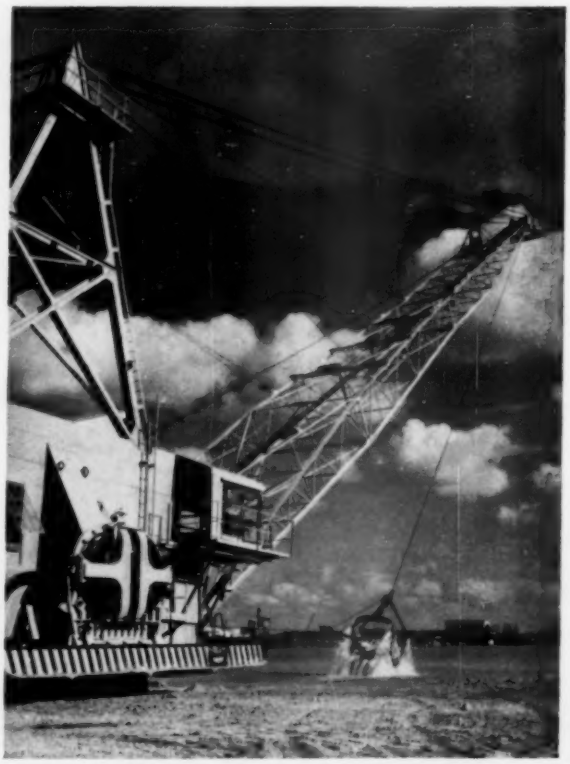
Power centers have connected kva. as follows in the distribution arrangement:

| Department | Power center kva. | Connected kva. |
|---|---|---|
| Crusher | 500 | 618 |
| Raw mill aux. | 750 | 1,208 |
| Kilns | 1,500 | 1,797 |
| Storage & cranes | 750 | 1,023 |
| Clinker mills | 1,500 | 2,055 |
| Silo | 750 | 1,170 |
| Packhouse | 300 | 398 |

(All motors over 250 hp. are 4,000 v.)

Normally-open tie breakers are used between all double-ended power centers and the two single-ended units included in the clinker mill and silo and packhouse departments. In addition to these ties, normally-open ties are included between some of the operating departments to obtain more reliability economically. Power centers having ties with other departments in a secondary selective arrangement are relayed for the purpose of selective tripping—interlocking prevents parallel operation of power centers. Fig. 8 shows the relay coordination curves of the kiln outlet power center.

*Please turn to page 126*



RIGHT: An 8-cu. yd. electric dragline in the quarry has its own portable switchhouse and 1,000 ft. of 4,160-v. cable trailing it

*Chief Electrical Engineer, Lehigh Portland Cement Co.
†Industrial Engineering Dept., Westinghouse Electric Corp.

**The authors conclude their discussion of an electrical system for a modern cement plant, exemplified by Lehigh Portland Cement Co.'s Miami, Fla., plant. Part III continues the explanation of grounding low-voltage systems that was begun in Part II. In addition, it contains a description of power centers at the Miami plant, its quarry distribution system and instrumentation and metering requirements*

*Rear-Dump "Eucs" have payload capacities of 10 to 55 tons—are powered by engines of 132 to 672 total h.p. . . . have loaded speeds up to 41 mph.*

# *Check Euclid Performance for Lower Hauling Costs*

Leading contractors, mines, quarries and industrial users of heavy earthmoving equipment the world over have standardized on Euclids for tough off-highway hauls. They know from years of experience on their own operations that "Eucs" get more work done every shift — that production cost is lower than with other types and makes of equipment.

Euclid has a complete range of sizes and models to fit every job requirement — rear dump and bottom dump haulers, self-powered scrapers and the world's most powerful crawler tractor. Your Euclid dealer will be glad to provide a production-cost estimate on your present or planned operations — be sure to see him before you replace or add to your equipment fleet — and have him show you why Euclids are your best investment.

**EUCLID** Division of General Motors Corporation
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*Bottom-Dumps carry payloads of 13, 17 and 30 cu. yds. struck . . . are powered by 227 to 432 h.p. engines . . . have top speeds up to 33 mph. Full length, unobstructed door openings make these "Eucs" ideal for dumping free-flowing material into drive-over hoppers.*

*The TC-12 Crawler has 2 engines and independent track-drive . . . 425 net h.p. . . . full power shift . . . top speed of 7.8 mph. This "Euc" tractor has unequalled work-ability for heavy dozing, ripping and similar work in construction, mining and logging.*

*This "Twin" Scraper has 2 engines with Torqmatic Drive . . . all wheel drive permits self-loading . . . struck capacity is 24 cu. yds. There are six other Euclid Scrapers, overhung engine and six wheel types, with struck capacities ranging from 7 to 24 yds.—9 to 32 yds. heaped.*

GM GENERAL MOTORS EUCLID

# EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

## HOW TO GROUND QUARRY EQUIPMENT

*continued from page 124*

Spare drawout circuit breakers are included in power center switchgear lineups. Space also is included for the future addition of breakers. Both of these features facilitate handling of additional loads and provide for some future expansion.

The low voltage used throughout Lehigh's Miami plant is 480 v. Reasons were these: A 600-v. system was discouraged because of the limited availability of 550-v. equipment from stock. On the other hand, 220-v. equipment results in an appreciable increase in power center, control and cable costs, as well as increased voltage regulation and power losses.

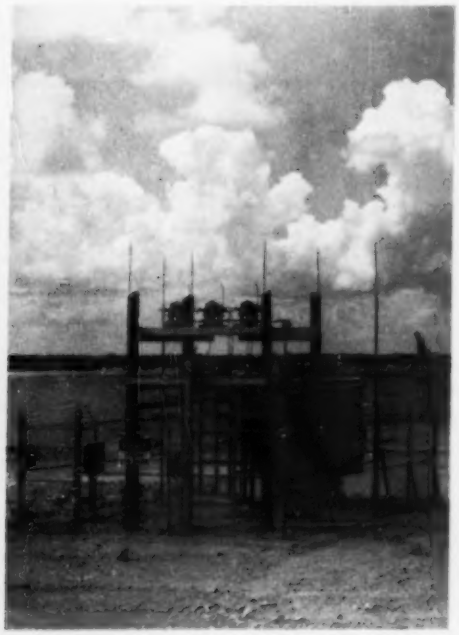
Each power center includes potential transformers and ground detector voltmeters to indicate the first ground on the normally operated ungrounded system. An immediate power outage is scheduled to remove the ground from the system. By permitting an unplanned outage to be turned into a planned outage in this way, we believe there is an additional degree of service continuity under proper maintenance and operating conditions.

The kiln power center, as seen in Fig. 9, is a conventional 1,500-kva., double-ended arrangement. Fig. 10 shows a layout of the clinker mill power centers. Note that the two 750-kva. power centers are close-coupled "inside out" with a cable tie between them, effecting a double-ended arrangement. The inside-out arrangement permits use of close-coupled control centers on either end of the power center.

**Special grounding equipment is needed in the quarry** for personnel safety, because of widely varying ground impedance and the use of portable equipment. The safety neutral resistance grounded system is desired both at the distribution-voltage and low-voltage quarry systems to keep frame-to-ground voltages from portable machines at safe levels during ground faults.

The quarry distribution system used at Miami is shown by Fig. 11's single-line schematic. An underground cable feed from the quarry breaker in the switchgear room terminates into a pole-held

*Please turn to page 128*



A SECONDARY TRANSFORMER SUBSTATION isolates the quarry system from the plant distribution system

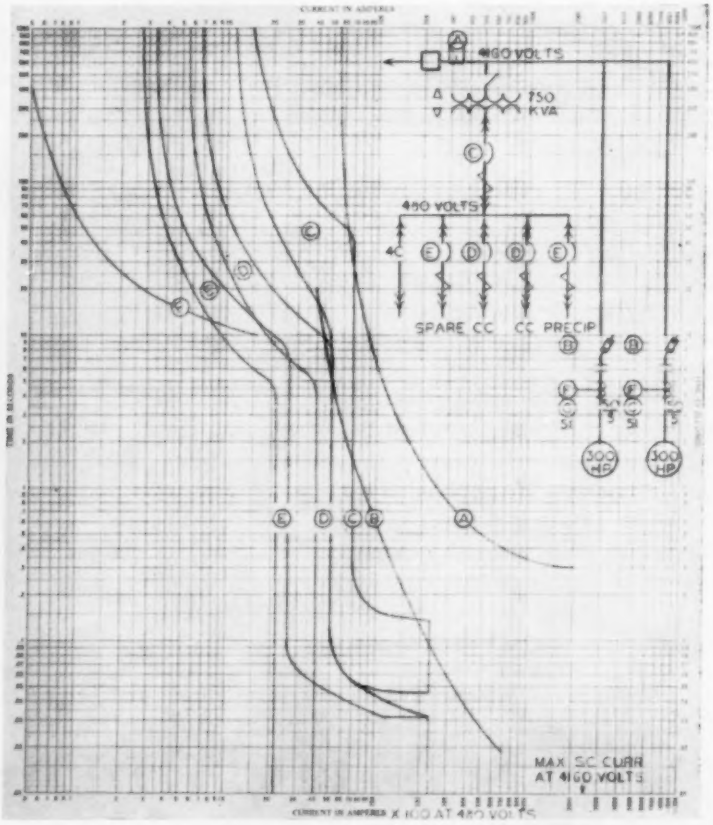



FIGURE 8—Time-Current characteristics for phase overcurrent coordination at outlet end of kiln power center

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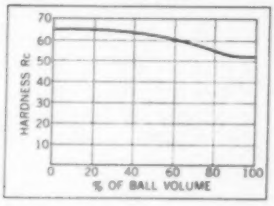


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## HOW TO GROUND QUARRY EQUIPMENT

*continued from page 126*

messenger cable 700 ft. away. A 1,300-ft. run of messenger cable ends at the quarry substation.

A 2,000-kva., 4,160-v. delta primary, 4,160-v. wye secondary transformer isolates the plant distribution system from the quarry system; therefore, a safety neutral resistance grounded system can be used for the quarry. A 96-ohm, continuously rated, neutral grounding resistor limits the maximum single line-to-ground-fault current to 25 amp. The safety resistor ground grid is located separately from the arrester and substation ground grid to minimize voltage surges on the safety ground wire from primary ground faults and lightning surges. Here, we followed the recommended 50-ft. minimum separation.

The ground wires included in the shovel cables attach to the frames of the portable equipment from the substation safety ground point. Frame-to-ground voltages are held to less than 50-v. with a ground wire of less than 2-ohm impedance during single line-to-ground faults.

Portable switchhouses, cable-fed from the quarry substation, are 1,000 ft. from a dragline and a shovel. Each switchhouse contains a disconnect switch which provides a visible means of circuit isolation, and an oil circuit breaker which permits automatic isolation of faults. Each switchhouse uses a balanced-flux, 3-phase current transformer and a ground relay to isolate ground faults down to 5 amp. instantaneously. Phase relaying consists of long-time induction disc relays to override the accelerating inrush of the shovel and dragline set, yet it provides some measure of cable protection.

Instrumentation and metering requirements of present-day cement plants are much more elaborate than they were 15 years ago. Controlling and recording meters are used for practically every phase of the operation today. Operating practices require both indicating and recording meters for on-the-spot checks of the process. Cost accounting systems insist that the departmental charges be accurate for each type of product.

*Please turn to page 130*

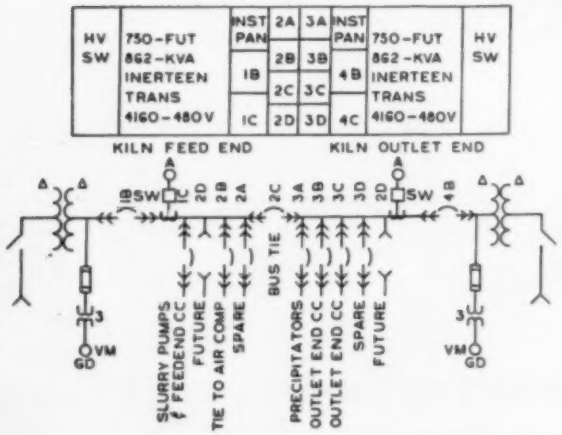


FIGURE 9—The kiln power center is a conventional 1,500-kva. double-ended arrangement

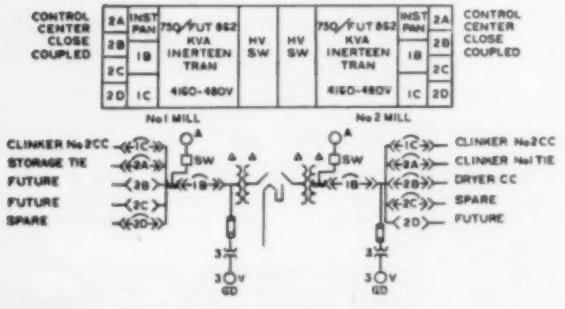


FIGURE 10—Layout of the clinker mill power centers with two 750-kva. power centers close-coupled inside-out

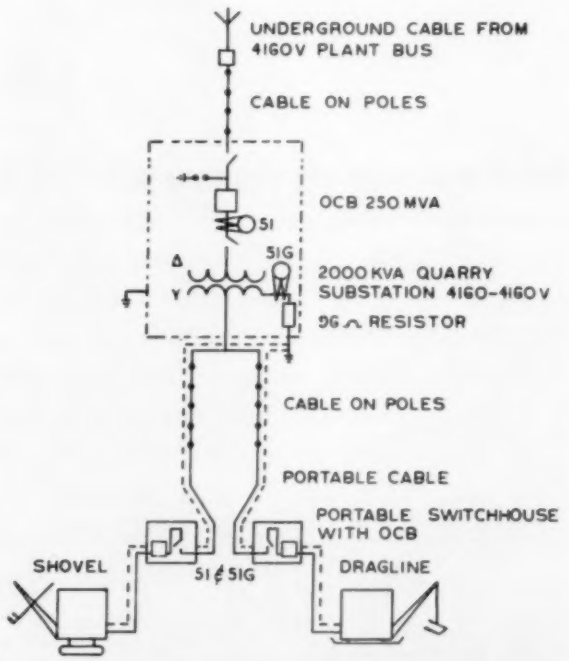


FIGURE 11—The solution of the power distribution problem in the quarry

# NEW!

# WEST VIRGINIA'S 1960 STANDARD BAG CONSTRUCTIONS TO SAVE YOU MONEY

Substantial savings for cement companies are achieved by two new standard WONDERWALL bag constructions perfected by West Virginia for packing Portland cement.

During a controlled test to determine possible savings in bag costs, various WONDERWALL constructions were developed in our Multiwall Packaging Laboratory. They were tested by 24 plants which shipped 1,118,415 barrels of cement in 5,282,966 WONDERWALL bags.

Result of this laboratory and field proving was the development of the superior "Optimum" and "Economy" bags for packing Portland cement. The new constructions are shown in the box.

*The new 3-ply Economy* WONDERWALL *is tougher than the 4-ply natural kraft multiwalls in all respects, and offers a cash saving of $2.75 per M in bag cost.*

The 3-ply Optimum WONDERWALL gives far better performance than the heavier 4-ply kraft multiwall, both in the mill and in transit. Whereas natural kraft breakage ran as high as 5% in truck shipments, the WONDERWALL Optimum bag reduced it to less than 1%. Breakage in rail shipments dropped from 6 to 10 bags per car to 1 or 2 maximum. The reduction in bag breakage alone provides a realistic cash saving, to say nothing of improved customer and employee satisfaction.

Secret of WONDERWALL strength is Kraftsman Clupak* extensible paper. Its built-in stretch withstands far more impact without breaking than conventional natural kraft. In a WONDERWALL bag, fewer plies are needed to do the job!

See how WONDERWALL standard bag constructions can cut your costs, increase your profits. Our technical service experts are ready to help you take full advantage of these new bag developments; call or write Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Avenue, New York 17, N.Y.

**Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications.*

**NEW STANDARD WONDERWALL CEMENT BAG CONSTRUCTIONS**

| Pounds Packed | Old Style Natural Kraft Construction | Optimum Wonderwall | User Benefit |
|---|---|---|---|
| 94# | 3/40, 1/50 | 3/50 | less breakage |

| | Economy Wonderwall | |
|---|---|---|
| 94# | 3/40, 1/50 | 1/50, 1/40, 1/50 | $2.75/M and less breakage |

WONDERWALL bags of the "Optimum" construction have reduced breakage at the North American Cement Corporation's Security, Maryland, plant.

**West Virginia Pulp and Paper**

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## HOW TO GROUND QUARRY EQUIPMENT

*continued from page 128*

The most complicated types of instrumentation are called for in automatic control of equipment. These instruments usually are the recording-controlling type and also serve as indicating devices. In process-control equipment of the recording type used by Lehigh, strip charts are giving way to circular 24-hr. charts.

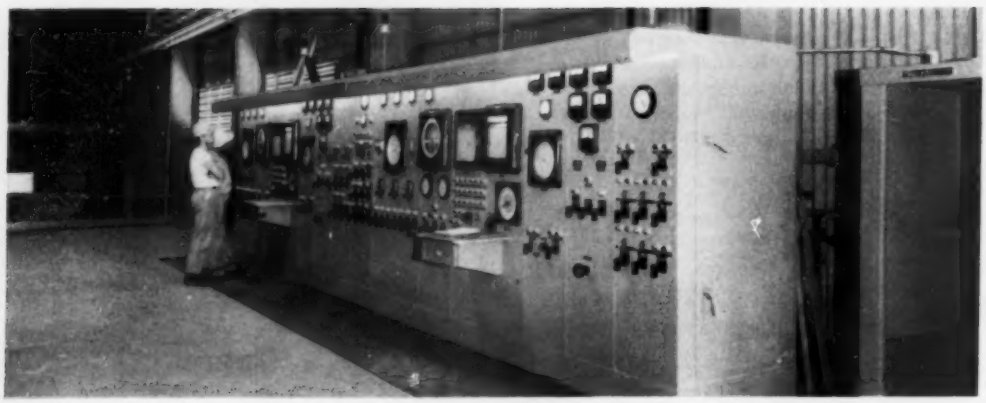
**Indicating instruments** perform an essential service to the plant operating departments. Their readings are checked by the operators constantly, even though the particular operation may be on automatic control. Lehigh's practice is to indicate on the scale by means of a legible mark the normal operating range. This has proven helpful to the operators in keeping the department at maximum output without overloading the equipment.

Where electric power meters are concerned, Lehigh's practice is to install departmental kwh. meters on each metalclad switchgear unit. Meters also are used on the low-voltage system. Each raw and clinker grinding mill drive has a kwh. meter, too, to indicate energy consumption for grinding various types of materials exclusive of that used by mill auxiliary equipment.

Furthermore, Lehigh's practice is to use metering instruments that duplicate those of the utility. This is done for check purposes and to give operators an indication of load conditions on the system. Instruments used by the utility for billing, demand and reactive power are duplicated by type and manufacturer. If possible, the power company instrument transformers are used. This practice was followed at Miami.

The operating experience thus far at Miami has been much as expected. Once the usual startup difficulties were overcome, there were few electrical problems. Placing of switchgear and control in clean, pressurized rooms, choice of adequate equipment and proper installation of this equipment is expected to give years of satisfactory, low-maintenance operation. **END**

POWER is metered to each department to permit allocation of power costs to each step in the cement-making process



THE OPERATION of two 12 x 475-ft. oil-fired kilns is recorded and controlled here

# Drill hard rock faster with your rotary rig and the

# GARDNER-DENVER "MOLE-DRIL"®

Now—add new versatility to your rotary drilling rig with the Gardner-Denver "MOLE-DRIL"* in three sizes: AM4 (4" dia.), AM5 (5" dia.) and AM6 (6" dia.).

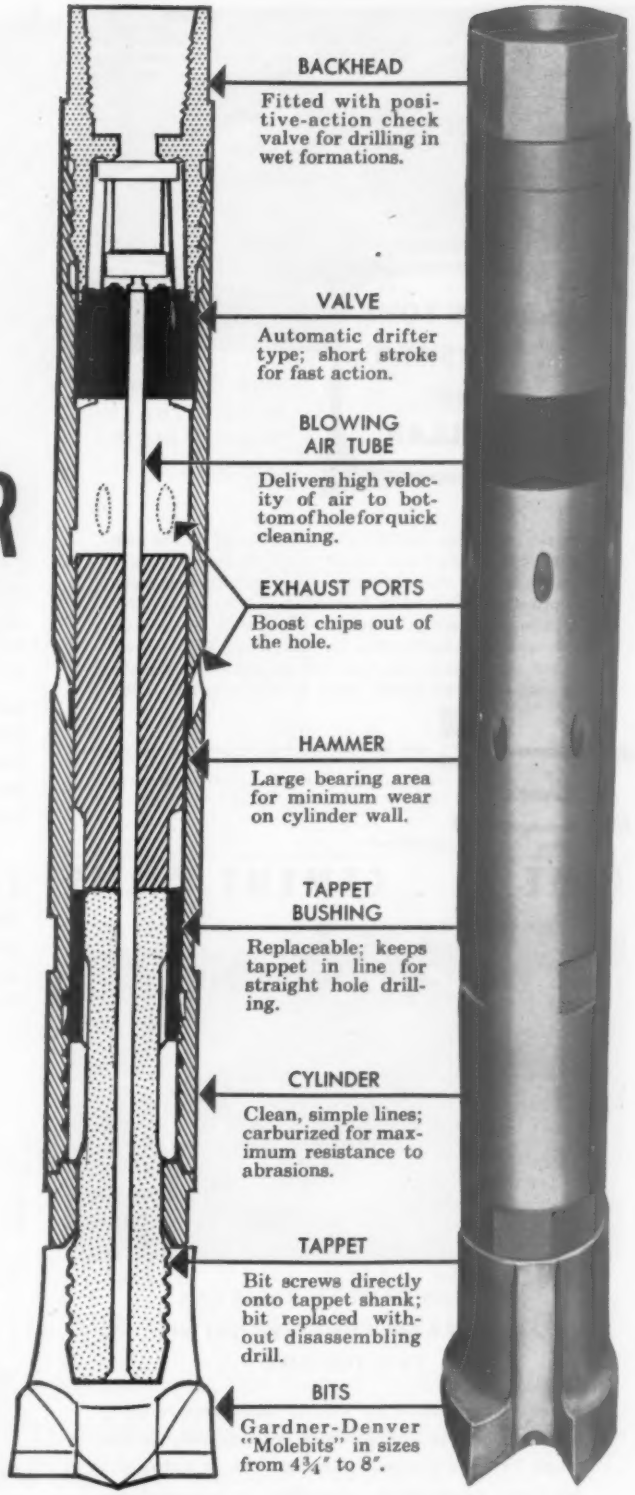
Add new power for fast hard-rock drilling with the heavy-duty, percussion-type "MOLE-DRIL." It screws directly onto your drill pipe . . . works at the bottom of the hole right at the rock face. There's no power-draining rod between the hammer and the bit.

## *ONLY 3 MOVING PARTS*

Rugged construction cuts down time. Simple design reduces wear and trouble. Only three moving parts: valve, hammer and tappet. Compare these Gardner-Denver "MOLE-DRIL" features right down the line:

*FOR FULL DETAILS,*
*WRITE FOR BULLETINS.*

**Trade-Mark*


BACKHEAD
Fitted with positive-action check valve for drilling in wet formations.
VALVE
Automatic drifter type; short stroke for fast action.
BLOWING AIR TUBE
Delivers high velocity of air to bottom of hole for quick cleaning.
EXHAUST PORTS
Boost chips out of the hole.
HAMMER
Large bearing area for minimum wear on cylinder wall.
TAPPET BUSHING
Replaceable; keeps tappet in line for straight hole drilling.
CYLINDER
Clean, simple lines; carburized for maximum resistance to abrasions.
TAPPET
Bit screws directly onto tappet shank; bit replaced without disassembling drill.
BITS
Gardner-Denver "Molebits" in sizes from 4¾" to 8".

GARDNER-DENVER Since 1859

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

**GARDNER-DENVER**

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

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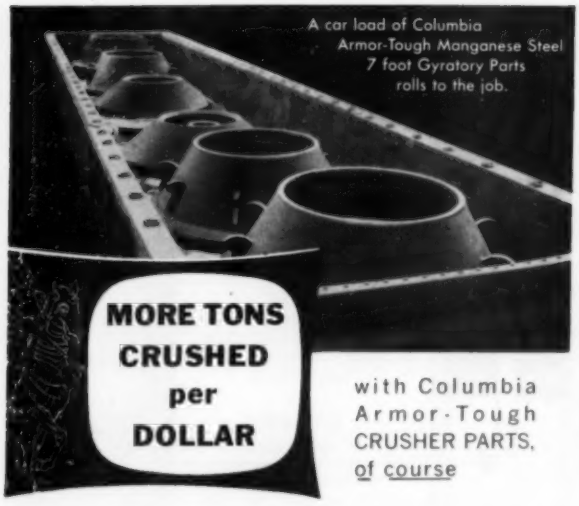


How do you judge mantles and bowl liners? By the number of tons crushed per dollar spent, of course. That is why more and more crushers everywhere are being equipped with Columbia Armor-Tough manganese steel replacement parts . . . because Columbia parts crush more rock per dollar. You try Columbia Armor-Tough crusher parts, and you, too, will become a Columbia customer. Get the facts. Send for bulletin No. 1063.

Columbia

COLUMBIA STEEL CASTING CO. Inc.
933 N.W. JOHNSON, PORTLAND 9, OREGON

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LIME . . . CEMENT KILNS

VULCAN OF WILKES BARRE CAN DESIGN & MANUFACTURE JUST THE TYPE YOU NEED

All equipment made by Vulcan must measure up to the standard of quality and responsibility it has taken 111 years to earn. Contact Vulcan today . . . estimates, constructive suggestions and preliminary drawings will be furnished (as far as possible) without obligation.

VULCAN IRON WORKS INC.

Wilkes-Barre, Pa. Cable Address: Vulworks

"The Oldest Name In Rotary Kilns."

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## NLA MEETING REPORT

*continued from page 122*

traffic managers, but of executives themselves, Mr. Harper suggested. "Savings to customers can be effected by efforts to keep rates for lime in line with other similar materials."

A railroad man was on hand to offer his suggestions for solutions to the railroad traffic problem. Mr. W. Mason King, vice president, traffic, Southern Railway Co., suggested these ways that the railroads may be helpful: (1) create markets for lime by fostering industrial developments; (2) use lime for soil stabilization on railroad track beds; (3) help lime to meet competition with other resources that do not involve the use of railroads, and (4) work closely with the lime industry to find better ways to do the job.

The growing industrialization of the South in its new move toward progress was reviewed by Mr. J. F. Crist, vice president, The Southern Co. He pointed out that the 1950 decade saw 1,308 new plants with a capital investment of $1½ billion, creating jobs for 154,000 people, shoot up in the South in the 120,000 sq. mi. area covered by his company. They represent diversified industries, many of them customers of the lime industry.

The convention included the usual group dinner, a beach barbecue party and the NLA annual golf tournament for the nearly 140 members, wives, guests and staff. The Operating Meeting is scheduled to be held in Chicago, Ill. during late September this year. **END**

"IT WOULD LOOK BETTER AS ¾ INCH AGGREGATE ON A CONSTRUCTION JOB!"

HEAVIER OUTSIDE WIRES mean great resistance to abrasion. FINER INSIDE WIRES mean excellent drum winding characteristics.

In REGULAR LAY ropes the wires are laid in a direction opposite to the lay of the strands. This provides stability even under severe operating conditions.

In LANG LAY ropes the wires and strands are laid in the same direction, providing exceptional flexibility and abrasion resistance.

# Two ropes in one! Roebling Herringbone® Wire Rope is designed and made to wear better, work better, last longer than you can possibly imagine . . . unless you've tried it yourself!

Herringbone combines two pairs of Lang Lay strands with one pair of regular lay strands to give you maximum flexibility, good stability, mighty strength. Call your Roebling Distributor — or write for details to Roebling's Wire Rope Division, Trenton 2, N. J.

HERRINGBONE WIRE ROPE

**ROEBLING**

*Branch Offices in Principal Cities*
*John A. Roebling's Sons Division*
*The Colorado Fuel and Iron Corporation*

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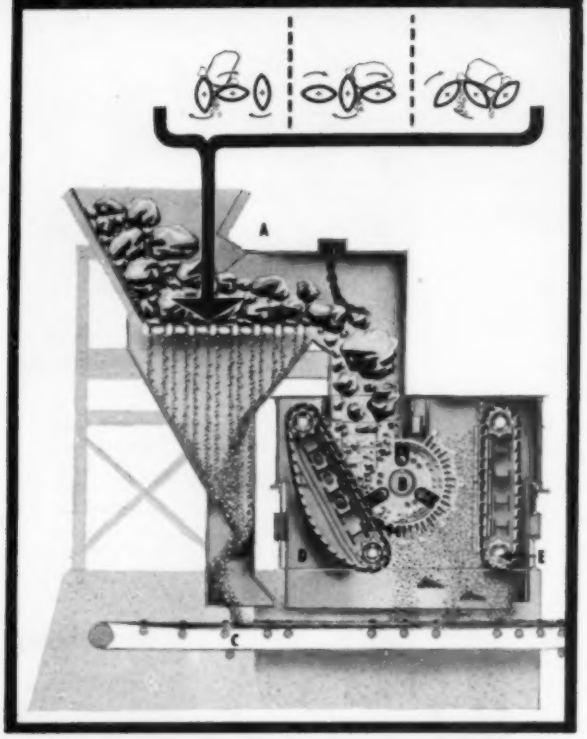
*New Wobbler Feeder-Hammermill combination*




# Increases capacity 50 to 100%

**The exclusive Universal Wobbler Feeder (patented) and Bulldog Hammermill combination was engineered for one of the world's largest cement mills to average 600 tons per hour. It can increase *your* capacity up to 100%! Here's why.**

The Wobbler Feeder (A) feeds the Bulldog Hammermill (B). Its tumbling, rocking motion sifts fines and clay through the bars to under conveyor (C). Only clean oversize rock is delivered to the Hammermill. The Wobbler Feeder scalps as it feeds without blinding or plugging, particularly valuable when wet, sticky material is a problem. Bulldog Hammermill's traveling breaker plate (D) and cleaning bar (E) eliminate build-up of sticky material in breaking chamber. Your crushing operation keeps going without clogging or jamming regardless of moisture present.

Since the Wobbler Feeder sends only oversize to the Bulldog Hammermill, the Bulldog can handle more material per day. Add this efficient, no-waste breaking power to the double, non-clog protection of this new combination and you can increase your production up to as much as 100%!

*For the name of the Hammermill representative nearest you, write:*

**HAMMERMILLS, INC.**

Subsidiary of PETTIBONE Mulliken Corp.

625 C Avenue N.W., Cedar Rapids, Iowa

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## ROCKY'S NOTES

*continued from page 16*

icals, are used for a variety of purposes: from lubricants to release or adhesive agents, water repellents, etc. Many readers are probably familiar with some of these products for use on concrete-product forms to prevent the concrete from adhering and for curing or waterproofing masonry units, although these products may not be identified by the manufacturer as silicones. Then from liquids with an increase in viscosity come silicone-rubber gums that are used for coating conveyor belts, etc. Here again the user may not know the nature of the material the belt manufacturer uses; and reading this book will help give him some ideas as to the best kinds to use, and aid him in writing his belt specifications, or understanding those of the belt manufacturer. Some of these silicone rubbers are used for electrical insulation, and here again the ultimate consumer would do well to learn something of their limitations as well as their advantages.

The most used silicones in the electrical industry are resins, which are the rubbers carried to still further stiffness or rigidity by more cross-linkages of the Si — O — Si chains. Water repellents for masonry units can also be made from silicone resins, so it is possible to select a water-repellent from a variety of products, or with various properties or methods of application.

At the time this book was written, silicones were being manufactured at the rate of $50 million a year. They were all special products with no great volume in any one; from chemical intermediates (that is, for the manufacture of some other chemical) to cosmetics, drugs and pharmaceuticals. The authors state: "The applications developed would, in some cases, be difficult or impossible with any known non-silicone material." A typical modern motor car, for example, uses about 550 rubber parts—bushings, mountings, belts, boots, covers, hose, seals, gaskets, diaphrams, etc.

Silicone rubbers can be used to advantage over any other rubber for many of these parts, which will give the reader some idea of the opportunities for silicone rubbers in his own processing equipment. Applications of silicone fluids, related to the field of rock products processing equipment, are for hydraulic, damping and lubricant purposes; for example, hydraulic couplings.

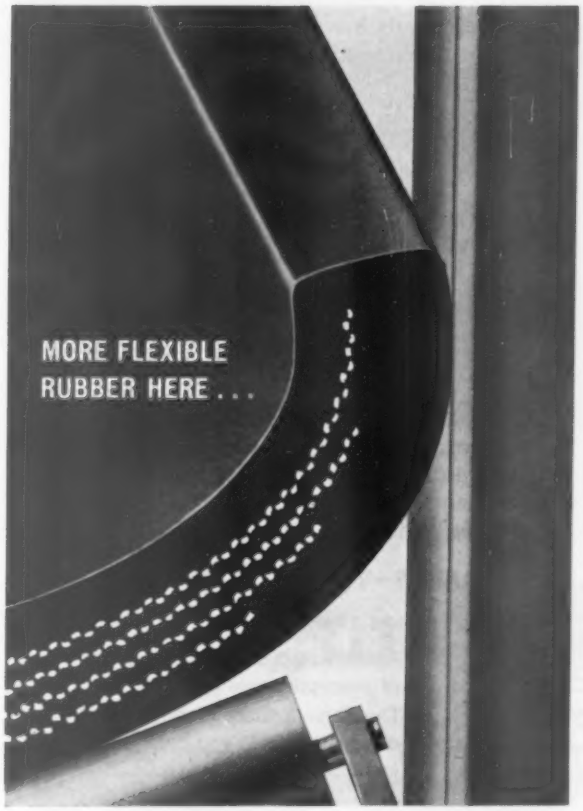
The use of silicones with which concrete products manufacturers are probably most familiar is as a water-repellent. The layman who wears eye glasses and cleans them with pieces of tissue trade-marked "Sight Savers" is using a water-

*Please turn to page 136*

Quaker Thermoid

# "COLEDGE" BELTING

# REDUCES EDGE WEAR, ADDS MILES OF USE!



Improper training can ruin a conveyor belt faster than any other abuse. Riding up and rubbing against a frame member soon wears away the stiff edge of conventional belting and exposes the carcass plys to moisture, mildew, dirt and eventual ply separation. "Coledge" belt construction was developed by Thermoid Division—to overcome this weakness and extend belt life.

"Coledge" construction puts plenty of extra rubber on the edges where it counts most . . . the plys are stepped back to make a more flexible edge that rides with the punches when misalignment occurs. This "Coledge" construction can put many extra miles on your system, especially in coal fields and sand and gravel pits where most belt failures are the result of excessive edge wear. Exclusive with Thermoid Division, "Coledge" construction is available in any standard type belt your application may require.

So, if you have an edge-wear problem with conveyor belts, specify "Coledge" construction. See your Thermoid Division industrial distributor for technical data or assistance, or write *Thermoid Division, H. K. Porter Company, Inc., 200 Whitehead Road, Trenton 6, New Jersey.*

**THERMOID DIVISION** PORTER **H. K. PORTER COMPANY, INC.**

**PORTER SERVES INDUSTRY** with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

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## ROCKY'S NOTES

*continued from page 134*

repellent silicone product. As to masonry water repellents, our authors state: "There are over 200 formulators of silicone masonry water repellents, the major market being the treatment of commercial and government buildings. Large-scale application by homeowners will undoubtedly open up in the future."

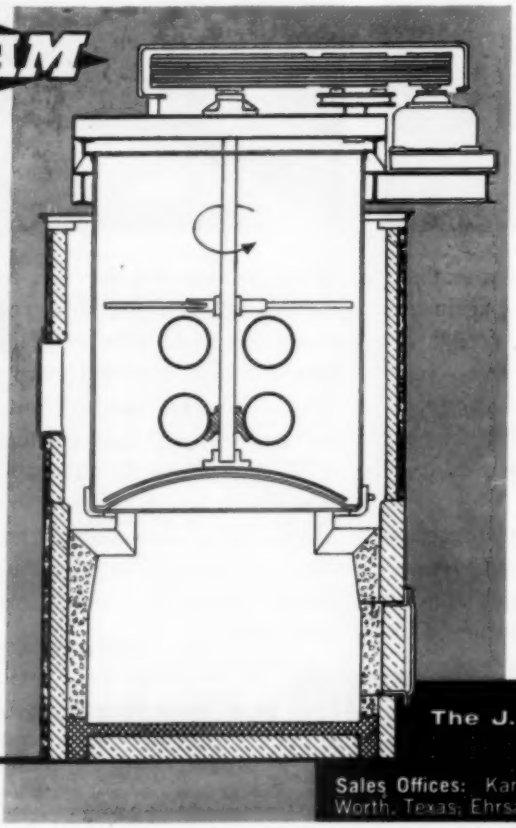
The masonry treated includes brick, mortar, concrete, gypsum, stucco, concrete block, slag block, tile, limestone and cinder block. The authors say that "silicones do not operate by actually plugging the pores of the masonry, but rather penetrate deep into the capillaries of the masonry structure and render the epores hydrophobic so that they resist the penetration of water under mild hydrostatic pressure. As a result, the masonry can 'breathe,' or transmit water vapor while holding back liquid water."

A particularly interesting claim made for silicone water repellents is that tests have shown they protect mass concrete from damage by freezing and thawing. Hence, silicones have already been used to protect concrete bridges and other highway structures. Our authors state that silicones are especially helpful in preserving the surfaces of concrete pavements from frost damage where salts have been used. They say: "Strips of road are under long-term testing in which silicone treatment replaces an oil spray which has been used for many years." It is claimed that the silicone treatment is more hydrophobic [water-hating], dries more rapidly and is more permanent and resistant to oxidation than the best organic oils. The silicone is applied in a 2 percent solution at the rate of one gallon per 100 sq. ft., by a tank truck driven at 3 miles per hour. It is readily appreciated that if this method becomes economical, it will be a great boon to concrete pavement construction in our northern climate.

One thing that has impressed us most in reading this book is the progress made in the structural chemistry of silicones in the 20 years they have been known. It is now possible to take the primary silica network or lattice of $SiO_2$ molecules or crystallites and knock off as many O's as desired and substitute some negatively charged element or radical to produce a silicone of any desired property or properties. In the chemistry of lime, cement and concrete we are dealing primarily with the same structures of silica, but after some 200 years of experience, experiment and learned research we still do not know the chemical structure of the end product, nor how to go about combining the elements or crystallites to get the products most to be desired for a particular use. **END**


EHRSAM

OUTSTANDING SUSPENDED CALCINING KETTLE



Another step in the improvement of processing raw gypsum. The Ehrsam suspended-type kettle is designed to help you cut installation and operational cost.

The new method of suspension of the kettle requires less brick and refractory expense, yet maintains a high-quality product. The new V-belt drive provides a quieter operation with a greater percent of efficiency. The automatic takeup, incorporated in the drive, insures perfect tension of V-belts at all times.

This shock-absorbing-type drive eliminates the vibration so often found in the gear-driven type of kettle. For further information, phone, wire, or write . . .

The J. B. Ehrsam and Sons Mfg. Co.
Enterprise, Kansas

Sales Offices: Kansas City, Kansas; Phoenix, Arizona; Fort Worth, Texas; Ehrsam Pacific, Inc., San Francisco, California

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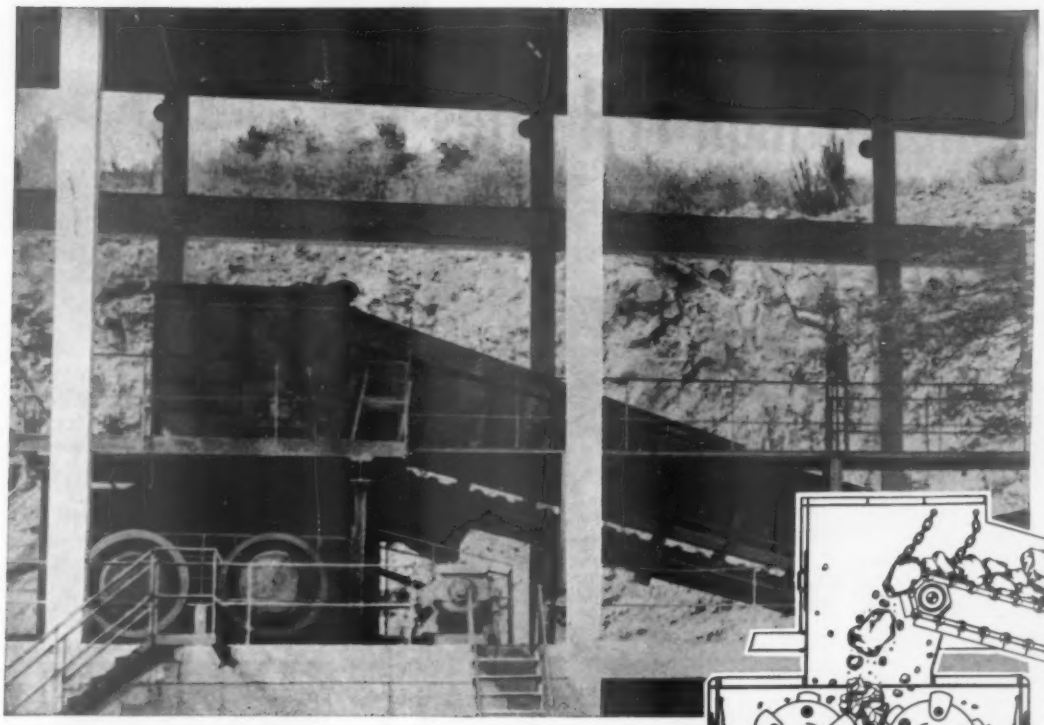
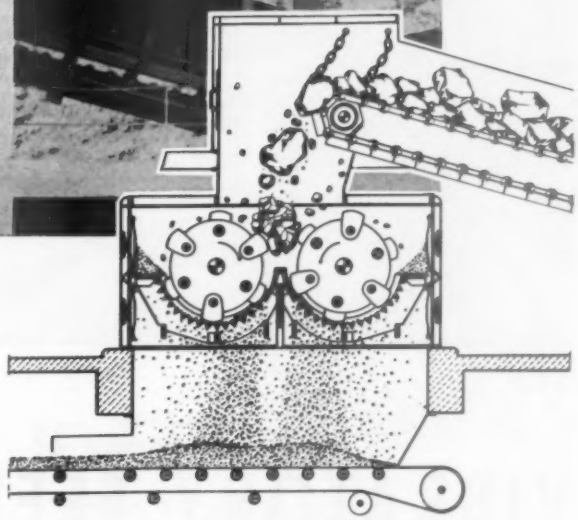
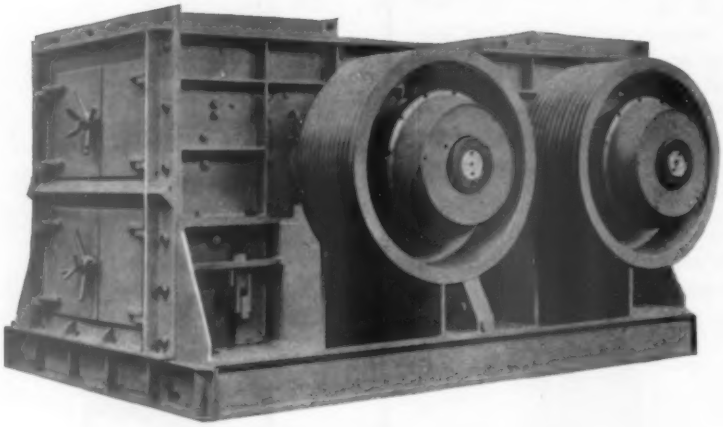




# MIAG-

## double-hammer-crusher „TITAN"



for
crushing quarry materials
down to a grain size
below 25 mm
capacity: 600 t/hr
Process: one stage process

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BRAUNSCHWEIG (Western Germany)

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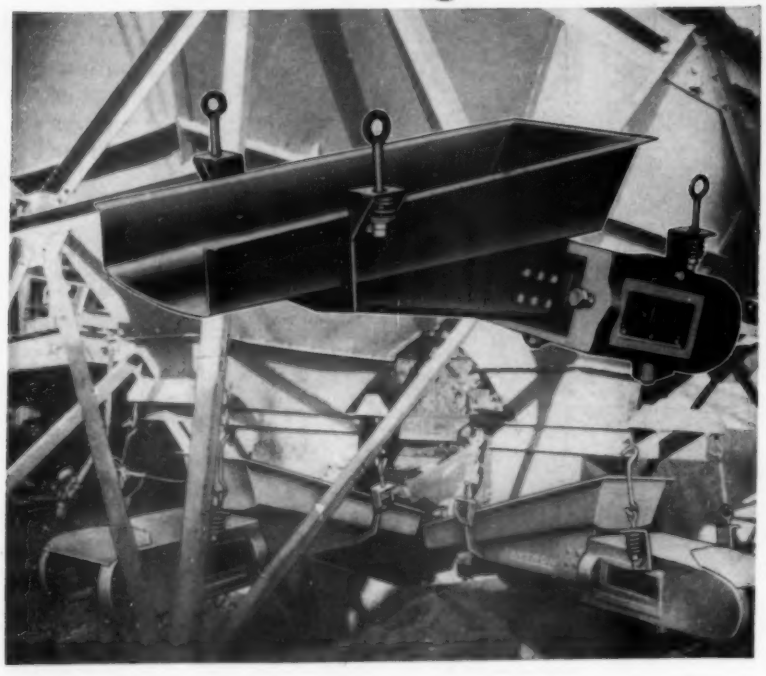
SYNTRON cost-cutting equipment of proven dependable Quality

# feed stone at high TPH rates



## SYNTRON Vibra-Flow VIBRATORY FEEDERS

* * * feed rock, aggregate, sand and other bulk materials at rates from pounds to thousands of tons per hour.

SYNTRON Vibratory Feeders give you these features for lower cost production:

—dependable flow feeding of bulk materials to conveyor belts, crushers, screens, etc.

—instant flow control, the power of vibration is instantly controllable for more efficient material flow.

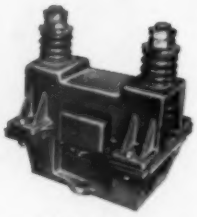
—durable and versatile, withstand heavy load shock and wear by abrasion. Compact, easily integrated into material handling operations.

—operation and maintenance economy—there are no mechanical wearing parts—no lubrication or periodic adjustments required.

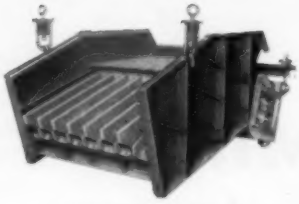
Install SYNTRON Vibratory Feeders for the dependable, low cost handling of all your bulk materials.

. . . write today for complete catalog data

## Other SYNTRON Equipment of proven dependable Quality



BIN VIBRATORS



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DRY FEEDER MACHINES

TEST SIEVE SHAKERS

VIBRATORY PACKERS

**SYNTRON COMPANY**

450 Lexington Ave. *Quality Equipment Since 1921* Homer City, Penna.

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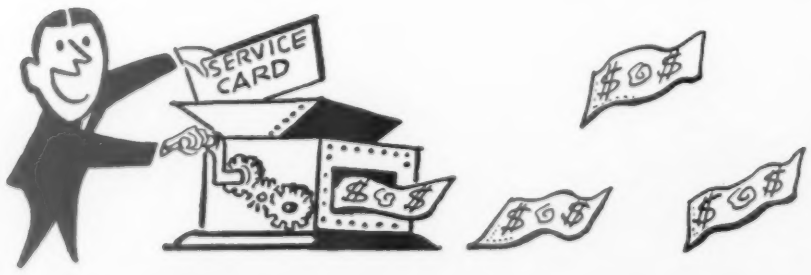

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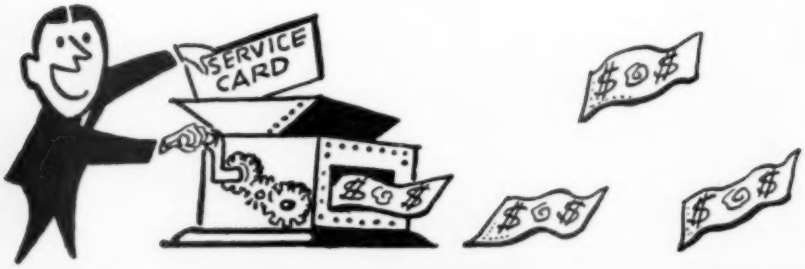

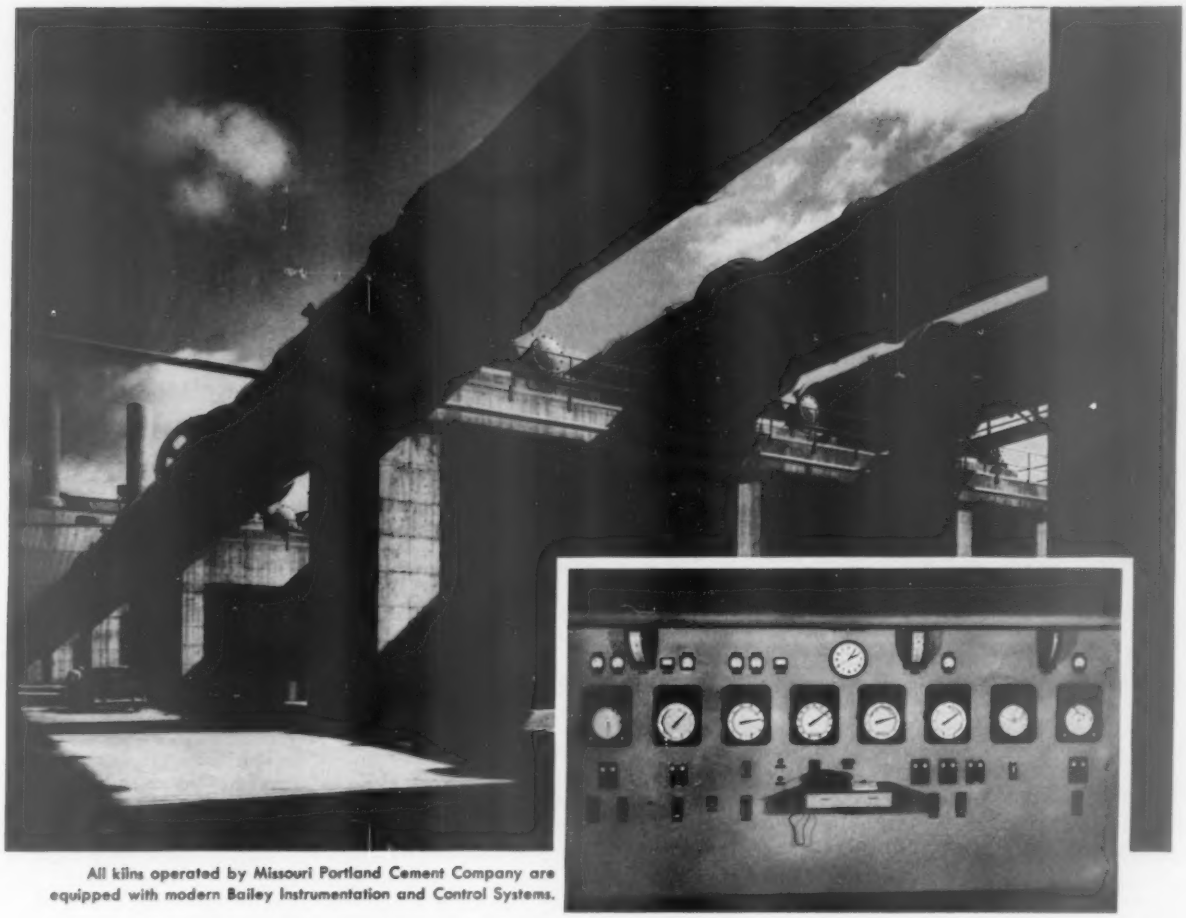

All kilns operated by Missouri Portland Cement Company are equipped with modern Bailey Instrumentation and Control Systems.

# How to control the digestion of giant kilns

These giant kilns have delicate stomachs. But the Missouri Portland Cement Company knows how to coddle them to get maximum capacity, uniform product and low fuel rate.

They do it with a Bailey Control System with a central Control Panel where a single attendant has complete control of the variables of combustion and heating.

Because the system keeps continuous chart records, the Burner can check the reading and trend of Kiln Speed, Exit Gas Temperature, % Oxygen in Exit Gas, % Combustibles in Exit Gas, Kiln Shell Temperature, Hood Draft, Temperature of Secondary Air Leaving Cooler, Temperature of Coal-Air Mixture from Coal Mill, Fuel Gas Flow, Feed End Draft, Kiln Speed, Cooler Speed, Cooler Fan Discharge Pressure, Cooler Undergrate Pressure, Cooler Air Flow, Coal Mill Primary Air Pressure, Coal Mill Exhauster Fan Suction, and Fuel Gas Flow.

The system works so dependably that week-long kiln runs have been made without the operator touching anything.

Let a Bailey Engineer help you plan for peak performance! For additional information write for a Bailey Kiln Control Folder. C-14

**BAILEY METER COMPANY**

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# NEW LITERATURE

FOR FREE INFORMATION on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue

### Worm gear speed reducers

LINK-BELT CO., Dept. PR, published a 66-page booklet, "Worm Gear Speed Reducers," that introduces the company's new line of fan-cooled worm gear speed reducers in 25 types and over 135 sizes. They are available in ratios ranging from 5:1, to 3600:1, with torque ratings up to 135,000 lb.-in. and hp. ratings up to 150.

The new booklet is illustrated with many application photographs, and lists equipment on which these reducers are frequently used. The fan cooling and other design refinements allow the size of these units to be reduced while retaining their load carrying capacities. Selection data includes rating tables arranged according to speed as compared to ratio, with the full complement of reducer sizes listed on individual pages for given rpm. Thermal input and mechanical output torques are shown for every speed and ratio for each reducer size.

*Enter 700 on Reader Card*

### Motor application guide

THE CENTURY ELECTRIC CO. has issued a 1960 motor application guide. This guide is a 16-page bulletin which outlines the company's motor characteristics between 1/20 and 400 hp. It includes up-to-date information on motors designs for dc. and single or polyphase ac. current.

*Enter 701 on Reader Card*

### Conveyor-scale systems

WEIGHING & CONTROL COMPONENTS, INC., has published a bulletin on the use of conveyor-scale systems for flow-rate control and total thru-put measurement of bulk materials. The bulletin deals with the use of conveyor-scale systems in conjunction with flat or troughed idlers, of fixed or variable speed, to provide in-motion weight measurement. System operation is explained and illustrated with pictorial diagrams. Application and performance data is given on all of the unitized system components.

A section of the bulletin describes the application of the company's conveyor-scale systems to a variety of control functions in processing and formulating operations, including ingredient proportioning.

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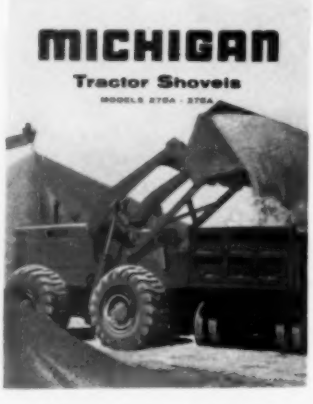
### Tractor shovel bulletin




CONSTRUCTION MACHINERY DIV., Clark Equipment Co., announces a bulletin describing two tractor shovels—models 275A and 375A. Both tractor shovel models featured in the booklet are designed for heavy-duty digging and loading jobs, and for operations where high materials handling output is essential. The booklet also points out that the 262-hp. model 275A is equipped with a 4½-cu. yd. bucket, and the 335-hp. model 375A is equipped with a 6-cu. yd. bucket. Complete specifications for both machines are given, together with information and illustrations on application of the tractor shovels to heavy duty and high production projects.

*Enter 703 on Reader Card*

### Conveyor idler

JOY MFG. CO. has published a bulletin which describes the series 200 belt conveyor idler, an improved version of the original two-bearing catenary idler introduced by the company in 1953. This idler consists of neoprene discs molded to a neoprene-covered, flexible steel wire cable suspended from two end-mounted bearings. It is said that the strain is reduced by free swiveling bearing mounts and extra reinforcement between end discs. The bulletin contains complete specifications, a detailed description of construction features, installation photographs and application instructions.

*Enter 704 on Reader Card*

### Matched jaw crusher

A NEW BULLETIN, #133-601, on a matched jaw crusher has just been released by Universal Engineering Corp. It explains the operation of two moving jaws in a single crusher, and how this feature accounts for faster feed, faster crushing and faster discharge of material. The bulletin also points out the outstanding features—long jaws, positive gear type drives and simplified jaw adjustment.

*Enter 705 on Reader Card*

### Magnet pulleys

STEARNS MAGNETIC PRODUCTS has announced the extension of their line of Indox V permanent magnet pulleys to include a complete range of sizes from 12 to 48 in. diam. Their new bulletin furnishes data and specifications on this complete line of pulleys. An easy-to-use selection chart is included.

*Enter 706 on Reader Card*

*(Continued on page 144)*

***Takes constant pounding day in and day out because it's* FORGED *and* HEAT TREATED**

# THE FORGED "CAPE ANALLOY" DROP BALL

***used and praised by quarry operators everywhere***

The "Cape Ann" **FORGED** Steel Drop Ball is noted for its long life and better wearing qualities. YOUR secondary breakage problems will be solved when you use a "Cape Ann" **FORGED** Steel Drop Ball. All "Cape Ann" **FORGED** Drop Balls are **SONIC TESTED** before shipment. Fully Guaranteed!

Highly Efficient Secondary Breakage means—More Tonnage—More Profits.

WRITE FOR INFORMATION

**CAPE ANN**

**ANCHOR & FORGE CO.**

P.O. BOX 361

GLOUCESTER, MASSACHUSETTS

*Enter 1460 on Reader Card*

# Drill Blast Holes 2 to 5 Times Faster...

The BLASTHOLER, a self-propelled rotary drill, is mounted on tracks or dual pneumatic tires. It covers the ground like a bulldozer. Only one operator is required, and the BLASTHOLER carries its own air for cleaning blast hole. In limestone quarries meeting highway specifications, the BLASTHOLER can drill 20′ holes in an average of 3 to 4 minutes. Many BLASTHOLERS have drilled more than a million feet within a 2-year period. The BLASTHOLER can improve your production record and save you money, too. Contact your nearest dealer for a cost-cutting demonstration today!

• ONE OPERATOR

• ONE MACHINE

BLASTHOLER drilling 25′ blast holes 3″ in diameter in limestone quarry. Production averages 1200′ per day.

## BLASTHOLER DEALERS

The W. W. Williams Co.
Columbus, Ohio

Reid-Holcomb Co., Inc.
Indianapolis, Ind.

Watson Equipment Co., Inc.
Pittsburgh, Pa.

Ray C. Call Co., Inc.
South Charleston, W. Va.

Illinois Road Equipment Co.
Springfield, Illinois

Williams Tractor Co.
Louisville, Ky.

Hi-Way Machinery Co.
Dallas, Texas

Bublitz Machinery Co.
North Kansas City, Mo.

James W. Bell Co., Inc.
Cedar Rapids, Iowa

Anderson Equipment Co., Inc.
Omaha, Neb.

Wylie-Stewart Co., Inc.
Oklahoma City, Okla.

Contractors Machinery Co.
San Antonio, Texas

Wisconsin Drilling & Equipment Co., Inc.
Madison, Wis.

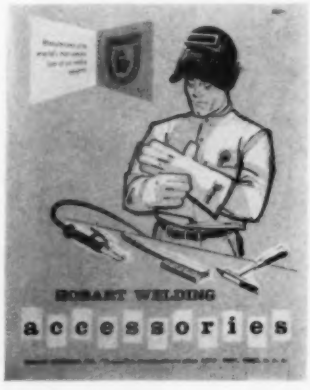
**DRILLING ACCESSORY AND MANUFACTURING COMPANY, INC.**

2006 South Industrial Boulevard Dallas, Texas

*Enter 1473 on Reader Card*


## NEW LITERATURE

*(Continued from page 142)*




### Welding accessories

HOBART BROTHERS CO. has a new 16-page welding supply catalog which gives information on the complete line of arc welding accessories and supplies. These include headshields, grinding shields, goggles, cleaning tools, electrode holders and miscellaneous equipment.

***Enter 707 on Reader Card***

### Rock bits bulletin

JOY MFG. CO. is offering a bulletin that discusses tungsten carbide rock bits. Bottom drive, shoulder drive and taper socket bits are illustrated and explained. A chart provides selection data for all types of bits made by the company.

***Enter 708 on Reader Card***

### Ammonium nitrate

FACTS YOU SHOULD KNOW about ammonium nitrate are described in a booklet released by P. W. Tucker, R. S. Neff and A. F. Dyer of the Phillips Petroleum Co. This booklet includes recommendations for warehousing bagged ammonium nitrate as well as suggestions in case of fire.

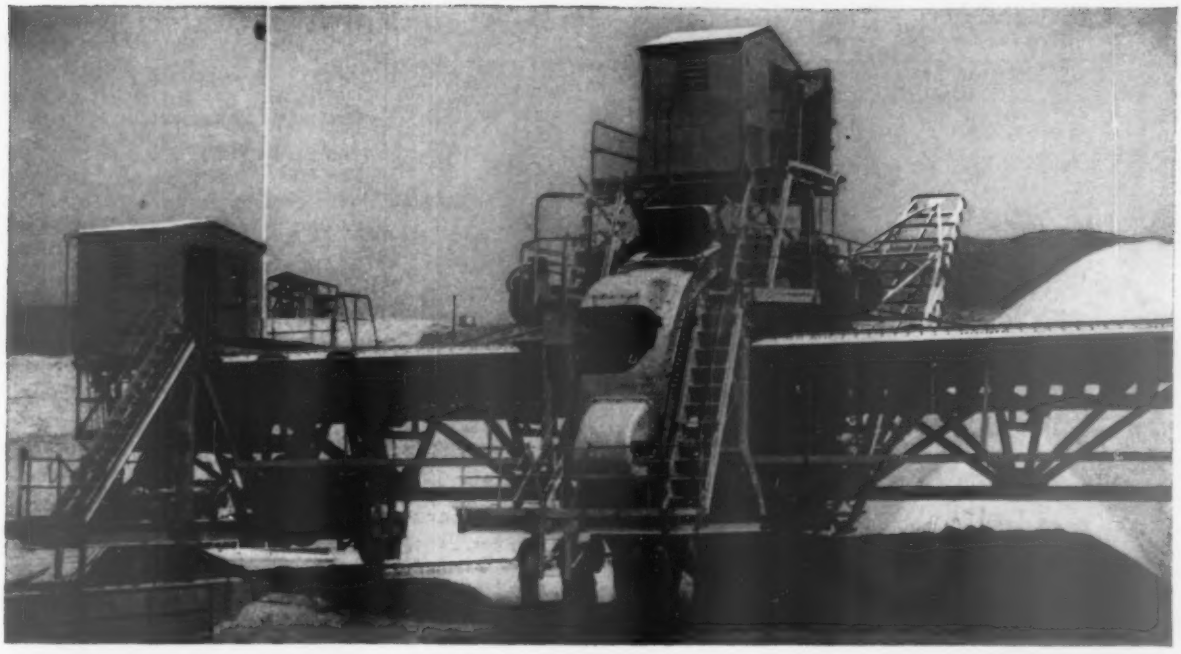
***Enter 709 on Reader Card***

### Clamshell and dragline buckets

WILLIAMS BUCKET DIV., The Wellman Engr. Co. has published a 32-page illustrated catalog covering all types and sizes of the company's clamshell and dragline buckets and stone grabs. Detailed information describing the principles of bucket operation and selection are included.

***Enter 710 on Reader Card***

*(Continued on page 146)*



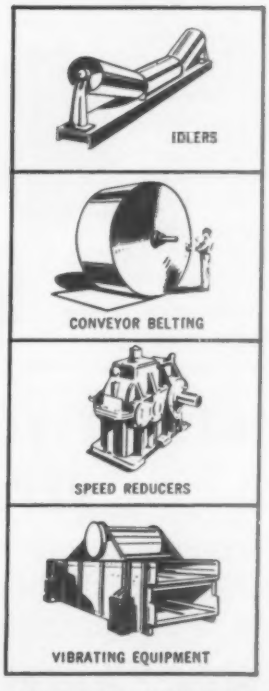
# BIG WHEEL

## It blends... it reclaims... it ends inefficiencies of selective mining

As part of a new H-R Rotary Bucket Wheel Blending and Reclaiming System, this giant 3-story wheel is capable of processing efficiently a broad range of materials . . . especially where more than one of the following typical situations exist:

1. Engaged in selective mining
2. Unable to comply with specifications
3. Too much coarse or fine material in feed
4. Storage pile requirements range 50,000 tons and over
5. Two or more types of raw material to blend for chemical compounding.

For full details consult your H-R representative, or write Hewitt-Robins, Stamford, Connecticut. Ask for Bulletin 7-19.




**HR HEWITT-ROBINS**

THE NAME THAT MEANS EVERYTHING IN BULK MATERIALS HANDLING SYSTEMS...

CONVEYOR BELTING AND IDLERS • INDUSTRIAL HOSE • VIBRATING FEEDERS, SCREENS & SHAKEOUTS • POWER TRANSMISSION EQUIPMENT

*Enter 1470 on Reader Card*

MASTER MECHANICS CORNER:

**James Steele,** Equipment Superintendent in charge of 27 machines for Hugh Steele Construction Company, Atlanta, Georgia, working on 6½-mile relocation of U. S. Route 29.

**"On our D8Hs working in sand, clay and rocky conditions, Cat lifetime lubricated rollers are giving us 20% more wear as compared to old type rollers."**

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

*Enter 1457 on Reader Card*

**GILSON**

**TESTING SCREEN**

A proven profit maker. Controls and guarantees your product. Fast, accurate, trouble-free.

For sizing test samples of crushed stone, sand and gravel, slag and similar materials in a size range from 4-in. to 200-mesh.

**GILSON TESTING SCREEN**
with motor, dustpan tray and 5 coarse series screen trays..$500 FOB Malinta, Ohio
Shipping Weight.....500 lbs.

Write for complete GILSON catalog

**SAMPLE SPLITTER**

Reduces large samples for convenient testing. Adjusts for all materials, sand to heavy aggregate. Simple to use. Heavy welded steel construction.

**SAMPLE SPLITTER**
complete with two material pans and bag-loading chute..$125 FOB Malinta, Ohio
Shipping Weight, crated.....195 lbs.

**GILSON SCREEN CO.**
MALINTA, OHIO

*Enter 1458 on Reader Card*

**WHAT ARE YOU PAYING FOR REPAIRS?**

The money you are paying to keep worn-out equipment working may be just enough for you to own better equipment.

*See the* **"WHERE TO BUY"** *Section*

## NEW LITERATURE

*(Continued from page 144)*

### Dust and fume control

THE DUCON CO., INC., describes the Orliclone, a new high-energy dust and fume scrubber in their bulletin. The bulletin presents a comprehensive description of the design and operational features of the scrubber. Also included are over-all dimensions, pressure drop vs. water rate curves, installation sketches and performance results in several difficult installations.

*Enter 711 on Reader Card*

### Vibratory feeder

SYNTRON CO. has announced the publication of a 32-page catalog on vibratory feeders. Complete descriptions, data and specifications are presented. In addition, data is included on three pneumatically and hydraulically vibrated feeders for explosive materials, dangerous atmospheres or for light, fluffy materials.

*Enter 712 on Reader Card*

### Perforated metal brochure

CROSS PERFORATED METALS, National-Standard Co., has issued a comprehensive 40-page brochure that outlines engineering data for complete specification of heavy-gauge perforated metal. The data covers various applications of perforated metal. Also included are directions for pattern specification, dimensions, unit weights, calculation of open area, materials selection, fastening methods and equivalence tables.

*Enter 713 on Reader Card*

### Inclined-grate coolers

THE FULLER CO. has released an illustrated bulletin describing the heat recovery, resultant low fuel cost and higher production features of both the recently developed horizontal-grate cooler and the more conventional inclined-grate cooler.

*Enter 714 on Reader Card*

### "Judging Engine Quality"

CATERPILLAR ENGINE DIV. has recently published an informative 28-page handbook titled "Judging Engine Quality." It emphasizes the features of various designs and discusses in detail the importance of, and the factors involved with: design, material and

workmanship; reliability; cost of operation; parts and service availability, and trade-in or resale value. Cutaway illustrations compare 4- and 2-cycle operation; multiple and single-orifice injection valves; precombustion chamber and direct injection of fuels.

*Enter 715 on Reader Card*

### Steel tubing bulletin

THE STANDARD TUBE CO. has made available a 4-page technical bulletin, containing a reference weight chart for square and rectangular welded steel tubing. In addition, this bulletin contains a comprehensive listing of square and rectangular welded tubing tolerances for twist, straightness, cutting length, corner radii and diagonial dimensions.

*Enter 716 on Reader Card*

### Crawler catalog

INSLEY MFG. CORP. has published a catalog on the ½-cu. yd. "Type K" crawler mounted machine. The catalog contains upper works, specifications, working ranges and lifting capacities as well as photos illustrating the newly designed wide vision cab.

*Enter 717 on Reader Card*

### Pendent switches

AN 8-PAGE ILLUSTRATED bulletin describes nine new pendent switches for electric hoist control manufactured by Joy Mfg. Co., Electrical Products Div. Safety and minimum maintenance are the principal features. Switches are available with two, four or six buttons, with one- and two-speed control.

*Enter 718 on Reader Card*

### "Operation stopwatch"

J. I. CASE CO. has published a time and motion study of crawler tractor efficiency, "Operation Stopwatch." The 8-page booklet analyzes the comparative performance of Case equipment with competitors. A color movie of the study is also available.

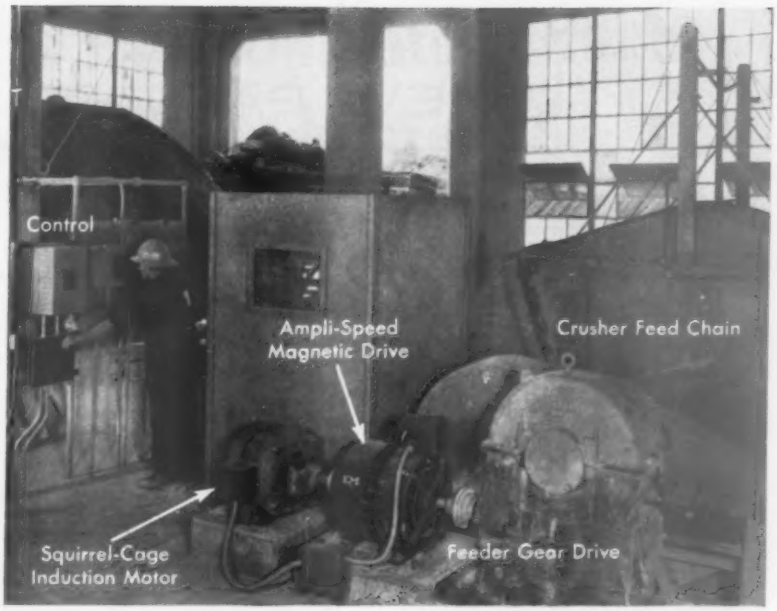
*Enter 719 on Reader Card*

### Mining chemicals

AMERICAN CYANAMID CO. has published a 12-page book, "New Developments in Mining Chemicals," describing products made available by the firm's research laboratory. Descriptive data and uses are included.

*Enter 720 on Reader Card*

**END**


## CEMENT COMPANY STEPS UP CRUSHER OUTPUT 10%

### *Stops overloading by automating feeders with E-M AMPLI-SPEEDS*

**PROBLEM:** "How to keep hammermill crushers fully loaded without overloading?" That was the problem facing operators of a large midwest cement plant.

Crushers were severely overloaded when heavy concentrations of rock were loaded onto the traveling feed chains a carload at a time. And to make matters worse, the steadily moving feeders kept right on feeding the already overloaded crushers. Yet, *in between* carloads the crushers were underloaded because the wound-rotor motors driving the feed chains were kept at their lowest speed to minimize overloading.

**SOLUTION:** Mill engineers replaced the wound-rotor motors with 20 hp, 1750 rpm squirrel cage induction motors they had in stock and installed E-M Ampli-Speed Magnetic Drives between the motors and the feeder gear drives. Simple control circuits were devised by putting a current transformer in each crusher motor power circuit and feeding its output through a rectifier to the Ampli-Speed Control.

**RESULT:** Now when crushers start to overload, motor line current signals the Ampli-Speed to stop the feeder. When the threatened overload passes, crusher motor line current drops and the feeder moves forward. This automatic start-stop action of the E-M Ampli-Speeds keeps the crushers fully loaded but never overloaded. Time saved between carloads by the increased speed of the feed chains has stepped up output 10%.

Do you have a speed control problem? . . . Ask your nearby E-M speed control expert for help. He will be glad to give you details about precise, adjustable control with Ampli-Speed. Also, write the factory today for Bulletin No. 1140-RP.

*Somewhere in your plant an operation can be improved with smooth, adjustable speed control . . .*

**DO IT YOURSELF WITH AMPLI-SPEED**

E-M

4400-TPA-2211

**ELECTRIC MACHINERY MFG. COMPANY**

Minneapolis 13, Minnesota

*Enter 1456 on Reader Card*

# NEW PATENTS

by OLIVER S. NORTH

## RECENTLY ISSUED PATENTS ON NONMETALLIC MINERALS*

### Gypsum

U. S. 2,934,830—In a method for drying calcined **gypsum,** the hot vapors are fed into the vertical shaft cooler countercurrent to an upward flow of calcined material. Condensed water is removed at the bottom of the shaft, and dry calcined gypsum is taken off at the top. (to A. Zvejnieks)

Canadian 595,467—Improved method for autoclaving crude **gypsum** to produce modelling or molding plasters. (to E. Borgardts.)

British 832,256—In the manufacture of **gypsum** board, the core composition comprises soluble anhydrite and/or calcium sulfate hemihydrate in the form of cellular granular particles, along with a retarder and optionally a lightweight aggregate such as expanded **perlite,** exfoliated **vermiculite, pumice** or the like, and a small percentage of **lime** or **portland cement.** (to J. B. Taylor; assigned to British Plaster Board Holdings Ltd.)

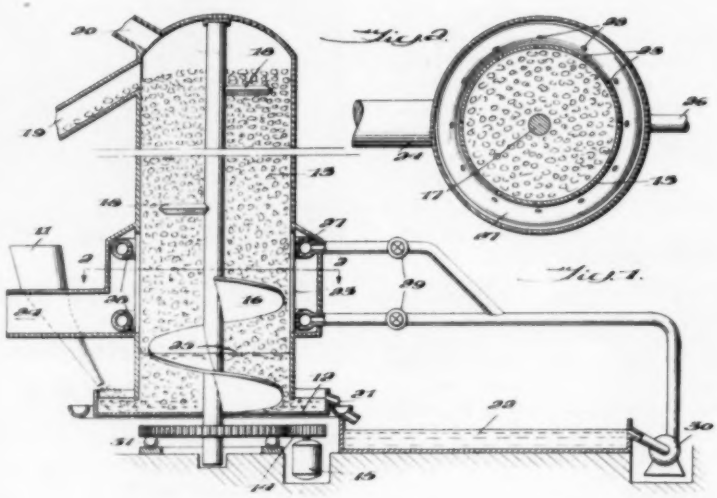


*Diagram data of Patent No. 2,934,830 shows how crushed gypsum is fed from hopper (11) into a slowly rotating bowl (12) which is partly filled with water to form a hermetic seal at the bottom of the drying shaft (13). Perforated screw (16) carries the gypsum upward in the shaft. Hot vapors from a calcining apparatus (not shown) are admitted through inlet (20) and led downward through ascending drying gypsum. Dry gypsum is removed through tube (19). Condensed vapor collects in the bowl and is led outward through overflow (21) to settling basin (22) where the suspended fine gypsum particles are settled out*

### Vermiculite

U. S. 2,931,716—In a method for converting liquids and powders into dry-appearing, free-flowing products, the liquid or solids-containing liquid is absorbed into exfoliated **vermiculite,** and the material then dried to deposit granules between the vermiculite laminae. This method is especially adapted to the production of a chelate material useful for making trace elements available to plants. (to J. A. Kelley and J. L. Ridgeway; assigned to Zonolite Co.)

British 827,665—Use of lightweight concrete made with exfoliated **vermiculite** for holding rigid the induction coil in an induction melting furnace. (to R. S. Segsworth)

British 828,229—In the making of fire-resistant, heat-insulating units, a mixture of exfoliated **vermiculite** and aqueous sodium silicate or potassium silicate is shaped, and the shapes dried in a carbon dioxide atmosphere. (to W. Murphy; assigned to Decorators [Liverpool] Ltd.)

### Cement

U. S. 2,932,498—Design for a stationary reactor chamber claimed to be useful for the production of **portland cement** clinker, said clinker being obtained in such small particles that it does not require crushing prior to being charged into finishing mills. Various advantages of heat efficiency and product quality are claimed, but it appears that a reactor of any practicable size would be of relatively small capacity compared with a standard rotary kiln. (to R. L. Metcalfe and V. E. Metcalfe)

### Phosphate rock

U. S. 2,924,511—Improved process for heat treating **phosphate rock** in the presence of silica as a flux to produce elemental phosphorus. (to H. Reintjes, R. H. Hughes and C. S. Livermore; assigned to Petrocarb Equipment, Inc.)

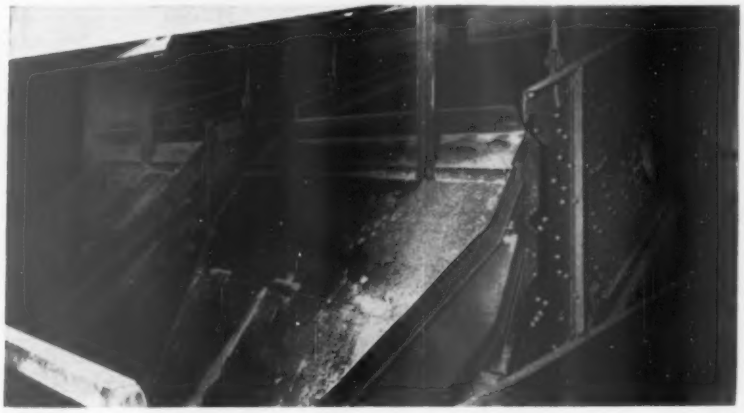
Canadian 589,719—Apparatus and process for concentrating Florida pebble **phosphate rock** or similar ores when flowing in a spiralling stream subject to the influences of gravity, centrifugal force and variations in the apparent specific gravity of the materials. Chemical reagents are added to the ore slurry to provide a selective control of the stratifying action. (to F. N. Oberg; assigned to International Minerals & Chemical Corp.)

END

# News Reports from Operators Reveal Stamina of SECO Twin Bearing Screens

**Now, you can expect and get a new kind of stout-hearted performance from 2-bearing screens.**

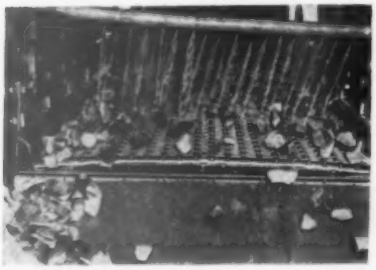
**That is, if they are SECO TWIN BEARING screens. Yes, actual results, reported to us by producers themselves, give strong proof that SECO design and engineering superiority really pay off . . . day after day, year after year where it counts . . . on the job. Today, with your own profits so dependent on operational efficiency, we believe it will pay you to get the full information about SECO TWIN BEARING screens.**



**"Over 1,000,000 tons without a whimper from our SECO TWIN BEARING screens" reports Jules Koczat of Buffalo Crushed Stone Corporation. "We've screened eight sizes of aggregate for 1½ years without a minute of downtime. We are so pleased we now have seven SECO TWIN BEARING screens on the job."**

"We like the action and performance of this screen." Joe Schwendt, Sup't., Amico Sand & Gravel Co., Riverside, N. Y.

"This screen is a real screener. Elmer is very happy with it, and says they will be ordering more of them in a month or so." R. P. Fulton, Southern Machinery & Supply Co., Roanoke, Va.



"This sieve analysis is a real endorsement for SECO TWIN BEARING screens." K. K. Kagarise, General Sup't., The Standard Slag Co., Youngstown, Ohio.

"Our SECO TWIN BEARING screens are doing a real good job of screening. Our only replacement has been screen cloth." Paul Padgett, Purchasing Agent, Thompson, Weinman & Company, Sylacauga, Alabama.

"I never believed a 2-bearing screen could perform like this." We're averaging 120 TPH in three sizes of gravel plus concrete sand . . . with no trouble at all on our 3 x 10 Triple Deck model." Eric A. Krehbiel, President, Clarence Sand and Gravel Corp., Clarence, New York.

**SEND FOR BULLETIN TB-21**

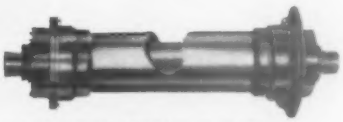
***Designed for Volume Low Cost Screening***

**SAND • GRAVEL • CRUSHED STONE • CINDERS • SLAG and AG-LIME**

**Single, double, triple and half deck variations. May be suspension or base mounted.**

**RIGID BOX FRAME CONSTRUCTION**

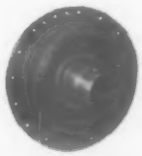
**Eliminates body distortion thus preventing undue stress on shaft assembly.**



**20%-30% HEAVIER AND STRONGER SHAFT**

**The heart of the screen, precision built with an extra margin of safety and with extra heavy bearing, too!**

**OIL BATH BEARING LUBRICATION**



**Provides more thorough lubrication for longer bearing life. Special flinger type seals prevent oil entering the tube assembly.**

**SECO**
**"TIME CONSCIOUS" VIBRATING SCREENS**

**SCREEN EQUIPMENT CO., INC., BUFFALO 25, N. Y.**

*Enter 1476 on Reader Card*

# NEW MACHINERY

FOR FREE INFORMATION on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue

## Safety gratings

A complete line of preassembled safety gratings and platforms is now available. This gives rock products producers the opportunity to install or replace walkways and platforms in locations where motors, screens and bearings need inspection or maintenance. The Protectoway Safety Sections are available in a wide selection of sizes all ready to erect. The basic assembly is resistance-welded by a method that eliminates bearing bars. (Bustin Steel Products, Inc., Dover, N.J.)

*Enter 300 on Reader Card*

## New hammermill

The new Hammermaster is offered to the rock products industry to achieve closer product control and to reduce excessive crusher fines. These advantages are a result of a larger hammer circle, new breaker plate design and larger hammers, according to the manufacturer.

The larger hammers are arranged in two or three rows, depending on crushing requirements for the material. A larger hammer circle lets the hammers rotate at slower speeds that reduce horsepower; sized material now can reach the grates before it has a chance to be overground.

Fast and positive adjustment of the breaker plate lets the operator control product size. Material is directed into the grate area and into the hammer path for secondary breaking of material that does not go through the grate. Two units are available: a 4136 and a 5136 size. (Universal Engineering Corp., Cedar Rapids, Iowa)

*Enter 301 on Reader Card*

## Lubricant applicator jar

An extreme-pressure grease is now available in a new, oil-resistant, molded plastic jar. This handy, unbreakable container is offered filled with 10 oz. of the maker's Molykote G.

Cap of the jar is fitted with an applicator brush on an aluminum ferrule which fits into a brush storage well in the jar. When the cap is in place, the jar is sealed against entry of dirt or moisture. Since the brush is secured to the cap, there is no need to use other applicators; the cap serves as a convenient brush handle. (The Alpha-Molykote Corp., 65 Harvard Ave., Stamford, Conn.)

*Enter 302 on Reader Card*

## Rule for truck performance

A truck manufacturer has developed a slide rule for determining or checking truck performance. Like most slide rules, this instrument gives a user the opportunity to determine variable values while related variables are held constant. For example, maximum driving speed of a truck can be determined once the engine hp. gross vehicle weight and road grade are set up in the scales. This instrument should prove to be a very useful tool for truck users whatever the make, model or age of their rigs. (The White Motor Co., 842 E. 79th St., Cleveland 1, Ohio)

*Enter 303 on Reader Card*

*Please turn to page 152*

## PRINCIPAL ADVANTAGES

1. Rugged construction and slow speed insure utmost dependability and minimum maintenance.
2. Whizzer separator gives a wide range of fineness with finger-tip control.
3. Automatic feed control assures maximum capacity — with only part of one man's time required for the mill operation.
4. Combined operations of pulverizing, classifying and conveying offer economies and simplification in plant design.
5. Flexibility of layout.
6. Dust-free operation.

*For further details, write for the Raymond Roller Mill Catalog #79.*

THIS huge 66" Raymond Roller Mill is the *heart* of the modern equipped plant of the Federal Foundry Supply Division of Archer-Daniels-Midland Company at Colony, Wyoming.

The raw bentonite is first reduced in a slicer ahead of an 8′ diameter by 60′ long rotary dryer where the moisture is reduced from 30% down to 8%-10%.

The Raymond Roller Mill then pulverizes, classifies and conveys the finished material to storage silos, where the product can go to bag packers or bulk loaders.

This Super Roller Mill has a rated capacity of 500 tons per day at a fineness of 90% minus 200 mesh. It can produce various grades, with classification easily controlled over a wide range.

Archer-Daniels-Midland Company has incorporated automatic control features in the system to permit operation of the entire plant by two men on a shift.

**COMBUSTION ENGINEERING, INC.**

*Raymond Division*

1108 W. BLACKHAWK ST.
CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

Enter 1475 on Reader Card

### Crawler dragline

A new ¾-cu. yd. dragline can be easily converted to a ⅝-cu. yd. trench hoe or shovel or to a 9-ton crane. Designated the Model 14-B, the machine's capacity and stability can be improved with the use of optional screw-jack outriggers.

Much of the capacity of the new machine is due to the prelubricated, factory-sealed ball bearing swing circle and single flame-hardened roller path. Other components are unit assemblies that can be quickly and easily replaced in the field. These are the swing circle, hoist shafts, transmission shaft and horizontal swing shaft.

Drive machinery includes large capacity, identical main clutches with interchangeable parts; identical, interchangeable main drum brakes, and reversible clutch bands. A choice of gasoline engines or diesel power with direct drive is available. (Bucyrus-Erie Co., South Milwaukee, Wis.)

***Enter 304 on Reader Card***

### New drill rig

A new crawler drill rig offers the rock products producer high-speed drilling efficiency. The maker states that 4-in. diam. holes can be made as rapidly as 3½ in. diam. with conventional equipment.

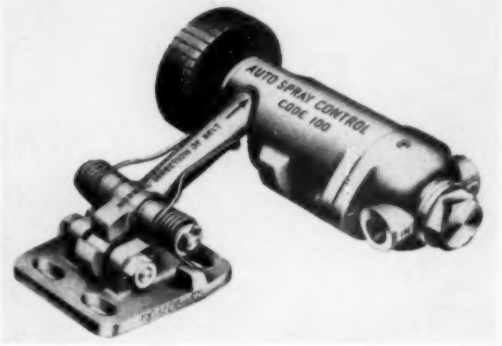
Two models of the Trac-Newmatic are available: the LDC-500R, mounting a new striking-bar type 5-in. drifter; and the LDG-400R with a similar 4-in. drifter. This model is recommended for drilling 2½ to 3-in. diam. holes.

Both models have forward, neutral and reverse rotation for rapid drilling, working with coupled steel or for extracting tight steel. The feed is powered with a new vane type motor designed to meet all drilling and power needs. An air motor-driven hydraulic pump powers and controls the raising, lowering, swinging and dump operations. Both models can be supplied with a hydraulic hand pump system for raising and lowering the feed support arm.

A low center of gravity and 10-in. wide tracks offer excellent stability in rough working areas. Tracks are spring-loaded to maintain tension, and lubricated track rollers can be removed for inspection or replacement. Optional equipment includes rubber track shoes and auxiliary dust collecting equipment. (LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.)

***Enter 305 on Reader Card***

### Rotary hydraulic valve



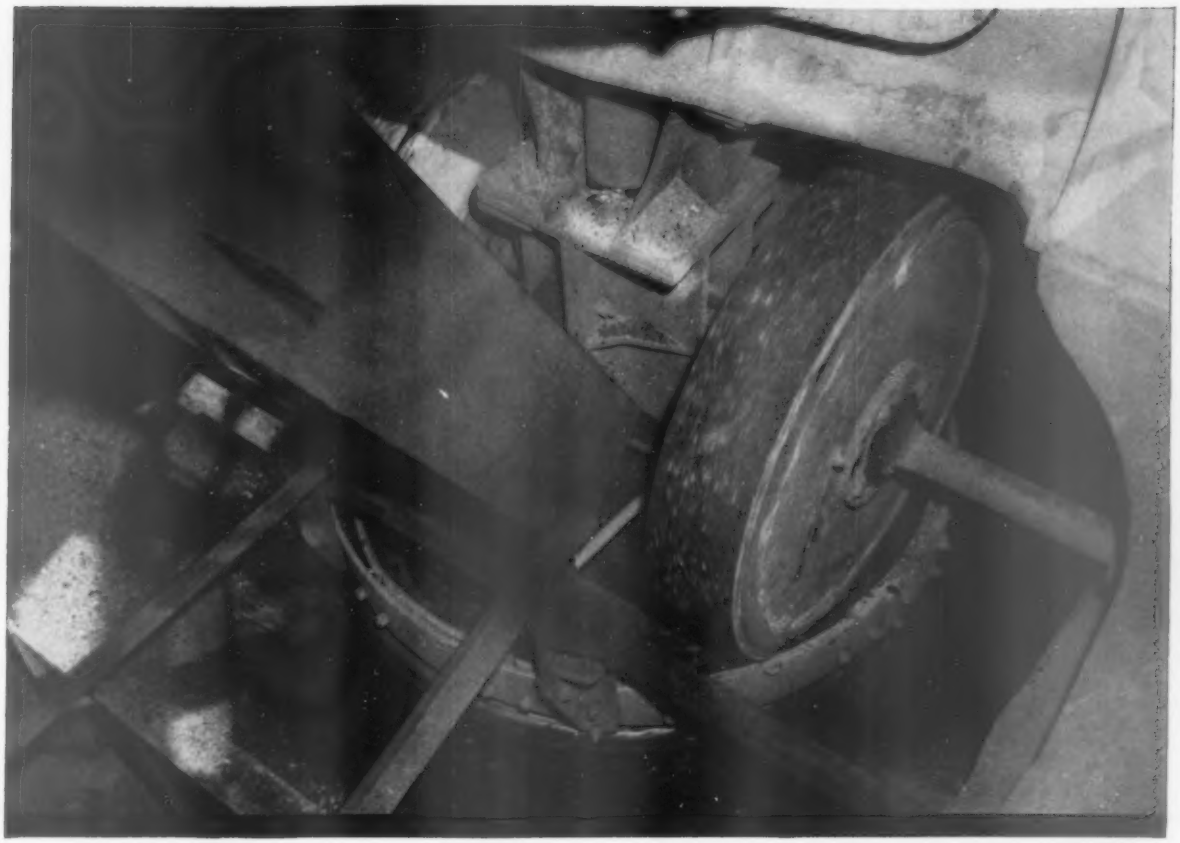

This valve can be used to control operations that can be directly tied to the operation of a loaded belt conveyor. Water or dust control compounds can be controlled to operate only when this new control valve is actuated by material on a belt conveyor. With a small change in the valve, it can be converted to microswitch operation. Then other valves, pumps, screens or other electrically operated equipment can be started or stopped.

A spring-loaded arm holds a small wheel that operates a hydraulic pump in the body of the valve. When the wheel turns, hydraulic fluid opens a valve in the liquid line, permitting full flow. When the wheel stops or loses contact with a belt, the valve closes and the flow of liquid stops. A cam at the base of the spring-loaded arm regulates the distance between the wheel and the belt or other actuating mechanism.

With microswitch operation, the new valve becomes a safety device as well as a process control tool. The hydraulic fluid in the valve works a push rod that operates the switch. The switch can be tied into sequence starting and stopping of other belt conveyors, feeders, gates and other equipment. (Megator Corp., 900 Manchester Ave., Pittsburgh 12, Pa.)

***Enter 306 on Reader Card***

*Please turn to page 154*



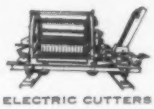
# 40,000 ABRASIVE TONS

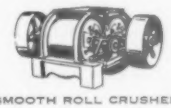
Grinding over 40,000 tons a year of lightweight aggregate produced by a patented process from bituminous coal refuse is the job of this AMERICAN #9 GRINDER, owned by Trulite Corporation, Ceredo, West Virginia.

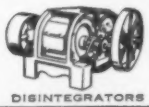
C. M. Howard, general manager, comments, "We choose the AMERICAN #9 GRINDER because of its reputation for durability and low maintenance. Our aggregate is extremely abrasive but the AMERICAN requires much less maintenance than other grinders we have used."

If the reduction of lightweight aggregate, cinders, pumice, haydite, slag, other mine and quarry products presents a problem in your plant investigate these AMERICAN features: Grinds wet or dry, no screen plates required, suspended mullers are adjustable to volume and size requirements, long wearing gears are cast material, only 25 horsepower required.

*Do your job the AMERICAN way.*


ELECTRIC CUTTERS


SMOOTH ROLL CRUSHERS


DISINTEGRATORS

PUG MILLS

GRINDERS

COMBINATION DE-AIRING MACHINES

**American**
**CLAY MACHINERY**
A DIVISION OF
HUBER-WARCO COMPANY • Marion, Ohio, U.S.A.

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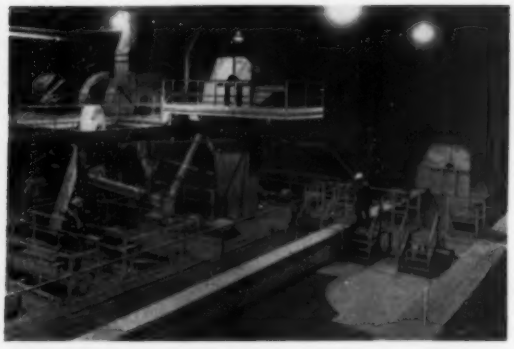


### Bucket elevator

A Type 14 bucket elevator has been designed for the heavy-duty applications in the rock products industry. While it will be ideal for handling portland cement, clinker and kiln feed materials, the new centrifugal discharge elevator will be suitable for crushed stone, gypsum rock, lime and sand and gravel. All components have been designed to resist the abrasion, corrosion or impact of these materials.

High capacity and continuous service is assured with the use of new style, high-front elevator buckets closely spaced on high-strength steel sidebar chains. The heavy gauge, self-supporting casings are of dust-tight construction.

Capacities of the new line of elevators range from about 2,000 up to 12,750 cu. ft. per hr. The Style AC buckets are available from 12 x 8 in. up to 27 x 12 in. fabricated of malleable iron or Promal. Perforated bottoms permit each bucket to release its load quickly and cleanly at the top of the elevator.

Steel sidebar chains are offered to meet the requirements of elevator height, bucket loading and material handled. Allowable chain pull ranges from 8,850 to 20,000 lb. Elevator boots are fitted with internal gravity takeups to maintain proper chain tension under variable loading conditions. (Link-Belt Co., Prudential Plaza, Chicago 1, Ill.)

***Enter 307 on Reader Card***

### Deep bin indicator

For material level control in deep bins, a new indicator with flexible shaft is offered. The shaft can be made long enough to sense the level of material at any specified depth in the silo, bin or hopper while the control element is bolted in place at the top of the storage bin.

The Flexi-Shaft indicator's 1/100-hp. motor turns the flexible shaft with its 4-blade paddle through a torsion spring, turning continuously as long as no material touches it. But the shaft stops the moment enough material is in contact with the paddle. The motor continues to run, expanding the spring until it actuates a limit switch. This turns off the motor and other equipment in the circuit. The cycle is reversed as soon as material falls away from the paddle.

Two models are available: standard and explosion-proof. Flexible shaft lengths can be made to suit bin depth. Motors and switches can be supplied for any common electrical current characteristic, and several types of limit switches are offered. (Convair, 1059 Bayridge, Pittsburgh, Pa.)

***Enter 308 on Reader Card***

### Portable conveyor

A new conveyor with vibrating screen offers full portability and high capacity at low cost. The complete assembly includes reciprocating feeder, conveyor and vibrating screen; it can be transported from one place to another without dismantling.

Both engine and conveyor drive are located at ground level. This concentration of weight at the foot end of the conveyor gives improved balance and stability as well as an unobstructed loading area under the vibrating screen. The conveyor may be fitted with either a loading hopper for shovel loading or a trap for bulldozer loading. The reciprocating feeder has five feed settings to control the amount of material loaded out.

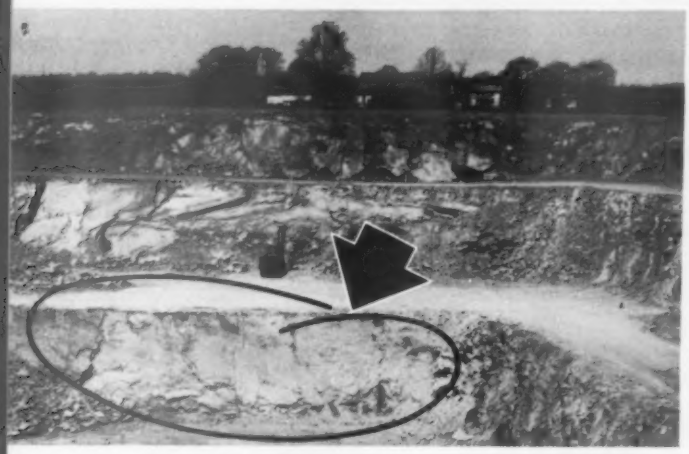
Standard conveyor lengths offered are 40, 50 and 60 ft. in belt widths between 18 and 36 in. to provide a full range of productive capacity. Vibrating screens range in size between 2½ x 6 ft. and 4 x 8 ft. Gasoline engine power is standard, but an electric motor is available where power lines can be brought up to the new unit. (Lippmann Engr. Works, Inc., 4603 W. Mitchell St., Milwaukee, Wis.)

***Enter 309 on Reader Card***

*Please turn to page 156*

# The shot *not* heard around the world

**How 2 new Du Pont products lowered the "boom" *and* the cost of this limestone quarry blast**



**1 THE PROBLEM:** Private farm (top of picture) is very close to 50′ limestone face to be blasted (arrow). Bradford Hills Quarry Co., Downingtown, Pa., wanted to (a) keep on good terms with its neighbors by keeping noise down, and (b) get the limestone out at lowest cost without sacrificing safety. Two new products from Du Pont teamed up to help them accomplish these results.

**2 ANSWER NO. 1:** 2,500 pounds of Du Pont's new "Tovex"-Gel and 2,000 pounds of "Nilite" WR for top load were put into 11 holes. This low-cost explosive has blasting energy equal or superior to higher priced gelatins, and high borehole density that gives more energy per foot than most other explosives. It's safer, too. Contains no nitroglycerine. Handles better. Brings maximum economy to blasting operations.

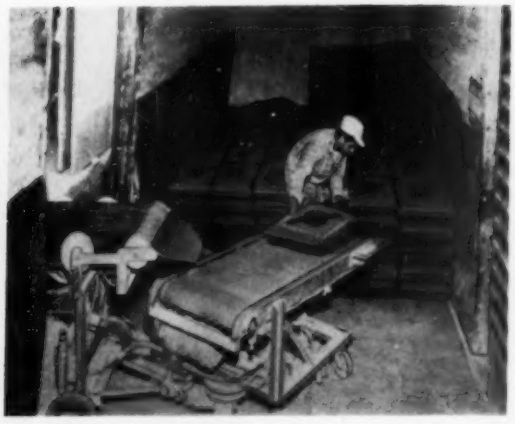
**3 ANSWER NO. 2:** New Du Pont LEDC (Low Energy Detonating Cord, developed by the Ensign-Bickford Co. in a cooperative effort with Du Pont) hushes the noise of blasting. LEDC trunk line, shown here being connected to down line of "Primacord," contains only 2 grains of explosive per foot, contrasted to 50 grains per foot of regular "Primacord." During this shot, neighbors heard little more than the sound of the breaking rock.

**4 RESULT:** Over 15,000 tons of well-broken limestone. And no noise complaints from neighbors. For a demonstration of "Tovex"-Gel or the Du Pont engineered Low Noise Level Trunk Line Delay Blasting System using LEDC, call your Du Pont Explosives distributor or representative. Or write Du Pont, Explosives Department, 6440 Nemours Building, Wilmington 98, Delaware.

DU PONT EXPLOSIVES

REG. U.S. PAT. OFF.

**BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY***



### Bag loading conveyor

The touch of a button moves this new high-speed bag loading conveyor into or out of a rail car or truck body. Another button controls the rapid flow and positioning of bags up to 100 lb. to make neat, tight loads. The new conveyor is the last unit in a system that conveys bags automatically all the way from packing station to shipping car.

The power-driven conveyor lets one man stack bags at a rate up to 20 per min. High-speed loading eliminates wheel trucks and back-breaking labor to put bags in the right position for secure loading; the single operator merely guides the bag into place. (Power-Curve Conveyor Co., 2185 S. Jason, Denver, Colo.)

***Enter 310 on Reader Card***

### Variable speed drives

This manufacturer's line of variable speed units has been extended to cover the 20 to 50-hp. range. These units offer stepless, infinitely variable ratios within the entire speed range of each drive. The new RS-33 is available with three ratios: 2.8 to 1, 3.8 to 1 and 5.5 to 1—and in four types in addition to the basic unit. The types include several combinations of input and output gears with integral foot-mounted motors to greatly extend the usefulness of the units while retaining their compactness.

Variable speed is attained by regulating the pitch diameters of two sets of driving and driven wheels with a single control screw. Two strands of specially designed leaf chains transmit power between the wheels. An input torque protective element rated at 125 percent of drive capacity is included on constant hp. applications.

The cast iron housing of the basic unit is ribbed to increase its thermal capacity. All moving parts operate in oil with automatic splash lubrication, and maximum protection is afforded against dust, moisture or adverse atmospheric conditions. Space requirements for the basic drive are about 25 by 31 in. for the 38-in. high unit. (Link-Belt Co., Prudential Plaza, Chicago 1, Ill.)

***Enter 311 on Reader Card***

### Car shaker

A new car shaker has been designed for one-man operation. It is light enough to be mounted on the side of a car with a jib crane or fork lift. Since there are no chains, rods or other connections, there is no need for an operator to get in, on or under the car.

The shaker is built with a vibratory rotor mounted in a self-contained steel frame. This assembly includes a balancing counterweight to simplify mounting and to improve the efficiency of operation. (Syntron Co., Homer City, Pa.)

***Enter 312 on Reader Card***

### All-wheel drive trucks

Newest all-wheel drive unit is a six-wheel, 45,000-lb. gvw. chassis designed to provide full-load operation under the severest conditions. The new C-5566 includes an 11,000-lb. capacity front drive-steer axle, 170-hp. gasoline engine, five-speed transmission and a 34,000-lb. capacity double reduction tandem rear axle.

Frame construction includes heat-treated chrome-moly steel rails with jig-assembled cross bracing. Assembly is completed with high-strength bolts. All models offer a range of wheel bases and chassis options to meet a range of heavy-duty requirements. (Autocar Div., The White Motor Co., Exton, Pa.)

***Enter 313 on Reader Card***

*Please turn to page 158*



***Enter 1478 on Reader Card***

## Now—palletize cement bags automatically!

The cement industry's *first* automatic bag palletizing system was installed recently at the Riverside Cement Company, in California. Riverside can now offer its customers faster, smoother, cleaner bag packing, loading and shipping—at less cost for labor.

This automatic bag palletizing system was developed and installed by packaging equipment engineers from St. Regis®, the Lamson Corporation and Riverside. It operates at speeds up to 25 bags a minute, with five bags to a tier. Selectors permit Riverside to build from five to eight tiers per load, depending on customer requirements. Riverside's palletized shipments have increased since installation of the new loader from 5 to 40%!

This success with automatic palletizing at Riverside, together with similar installations in other parts of the country, marks a major step forward in the industry. However, conversion to such an operation requires careful planning and a wealth of materials-handling knowledge. Our Bag Division Packaging Engineers have this experience and will work with your engineers and production staff to design your automatic palletizing system.

This is St. Regis *Packaging-in-Depth* in action—a complete bag service available from 13 manufacturing plants and 33 sales offices across the country.

**Packaging-in-depth by St.Regis** BAG DIVISION PAPER COMPANY

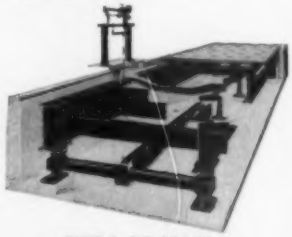
**Winslow TRUCK SCALES**
*PIT AND PITLESS TYPES*

**CABINET DIAL**

Weight indication available includes ball bearing poise weighbeams, direct reading and weight imprinting types, and dial equipment with or without weight printer.

**TYPE CS—PORTABLE—PITLESS**

Type CS scales, pitless installation, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 50 tons. Platform sizes 18' x 9' thru 50' x 10', wood or steel deck.



**TYPE S—PIT SCALE**

Type S scales, pit installations, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 60 tons. Platform sizes 22' x 9' thru 60' x 10' for wood or concrete decks.

Write or phone for more information
PHONE NORTH 1231

**WINSLOW GOVERNMENT STANDARD SCALE WORKS, INC.**

4830 NORTH 25TH ST. TERRE HAUTE, IND.

*Enter 1471 on Reader Card*

**Slurries...handled at lower cost**

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

Buy WILFLEY for Cost-Saving Performance

A. R. WILFLEY and SONS, Inc.
Denver, Colo., U.S.A.

WILFLEY Centrifugal PUMPS

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DON'T MISS THE "OPERATIONS IMPROVEMENT" ISSUE OF

**ROCK PRODUCTS**

COMING IN SEPTEMBER!

It has a special significance for all Rock Products Producers

## NEW MACHINERY

*continued from page 156*

### New shovel

A completely new, air-operated shovel with 3½-cu. yd. bucket has been announced. But it is flexible enough to be equipped with a lifting boom rated at 110 tons or a backhoe with 65-in.-wide bucket.

For its size range, the new 990 Series unit is claimed to be the easiest and quickest to prepare for transport. The side frames can be removed without breaking the traction chain, and it can be accomplished with the removal of a single large bolt at each axle.

A wide choice of diesel engines and either direct drive or torque converters is available. Brakes and clutches are oversize for long life and easy adjustment. Independent swing can be had with air-controlled friction clutches or hydrostatic drive. (American Hoist & Derrick Co., 63 Robert St., St. Paul 7, Minn.)

*Enter 314 on Reader Card*

### Portable gravel plant

A newly developed portable crushing and screening plant combines high output and low weight. Traveling weight of the new unit is said to be about 55,000 lb.

This Model 70 closed circuit plant has a capacity

exceeding 175 cu. yd. of gravel passing 1-in. screen based on 25 percent oversize. Component parts include a 10 x 36-in. jaw crusher, 32 x 24-in. roll crusher and a 4 x 12-ft. vibrating screen. (Diamond Iron Works Div., Goodman Mfg. Co., 48th Pl. & Halstead St., Chicago 9, Ill.)

*Enter 315 on Reader Card*

### 2¾-cu. yd. loader

Big new addition to a line of wheeled front end loaders is a 2¾-cu. yd. unit. The 966 Traxcavator has a 205-hp. diesel engine, 24,000-lb. breakout force and 154-in. maximum lift. Turning radius at the outside rear tire is about 20 ft. 9 in.

Equipped with two-speed power shift transmission, the unit has four operating speeds. It has a forward-reverse selector, a high-low speed selector and a choice of two-wheel or four-wheel drive. Three separate sets of brakes are standard equipment on the new machine. (Caterpillar Tractor Co., Peoria, Ill.)

*Enter 316 on Reader Card*

### Digital computer

A relatively low-priced but ultra-fast general purpose computer is offered to solve a broad range of industrial problems. The PB-250 has a large, expandable memory, a computing speed in the microsecond range and is said to be extremely versatile. At the same time, it is completely reliable for it can be set up to check its own operation and to monitor other operations. Completely transistorized, the new unit will be mass-produced incorporating components and integrated systems that are used nationally. (Packard Bell Electronics, 12333 W. Olympic Blvd., Los Angeles 64, Calif.)

*Enter 317 on Reader Card*

END


Manufacturers Since 1885—"BEST BY EVERY TEST"

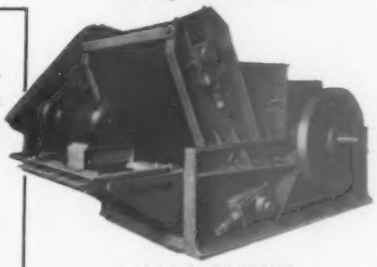
**One Operation Crushing!**

Gruendler "Monster Heavy Duty Impact Hammer Crusher with Moving Feeder-Breaker Plate, crushes hard to feed sticky clays, moist or wet shale and limestone formations with fewer shut downs and fewer maintenance costs.

**Serving Cement Mills**

**EXTRA HEAVY**
The moving Breaker Plate force feeds the materials directly to the crushing rotor.

**OUTLASTS**
Stationary Breaker Plates, 10 to 1.



**LARGE CAPACITIES up to 600 T.P.H.**

LOWERS PRODUCTION COSTS! The uniform crushing of shale and stone for better blending and final preparation by Raw Side Ball or Compeb Mills, means a quality cement. The Gruendler "Monster" Impact Hammer Crusher is sturdily constructed for a lifetime of service. Available with patented tramp metal catcher. Write for Bulletin "LARGE PRODUCTION CRUSHERS"

**GRUENDLER CRUSHER & PULVERIZER CO.**
Dept., R.P.-760 2915 N. Market St. St. Louis 6, Mo.

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**HANCO**
**HEATED SCREEN**
**Attachments**
Eliminate Cloth Blinding
On all types of Vibrating Screens
*WRITE:* **F. R. HANNON & SONS**
1605 Waynesburg Rd., S.E. Canton 7, Ohio
Cable address: HANCO

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**CONTRACT CORE DRILLING**

**EXPLORATION FOR MINERAL DEPOSITS**
INCLUDING URANIUM & LIMESTONE — ANYWHERE
**FOUNDATION TEST BORING**
**GROUT HOLE DRILLING**

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

*Core Drill Contractors for more than 60 years*

**JOY MANUFACTURING CO.**
*Contract Core Drill Division*
MICHIGAN CITY, INDIANA

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# MANUFACTURERS NEWS

## Link-Belt announces new managerial promotions

TWO LINK-BELT SPEEDER CORP., Cedar Rapids, Iowa, vice presidents, N. V. Chehak and M. P. Luber, have just been appointed members of the company's Board of Directors. At the same time, Chief Engineer F. J. Strnad was named vice president and chief engineer. Mr. Chehak (left) has been with the company 12 years. Mr. Luber (center) started with the company in 1946. Mr. Strnad came to the company in 1945.

## Pioneer Engineering to sell Allis-Chalmers Hydracones

MINNEAPOLIS-BASED PIONEER Engineering Div. has announced an agreement wtih Allis-Chalmers Mfg. Co. to sell part of their line of Hydracone crushers. The five sizes covered by the agreement are those commonly used in portable or semi-portable crushing and screening plants. Both companies anticipate that the new contract will extend the application of its equipment. Pioneer now can supply all major types of crushers for its line of portable and semi-portable plants to meet virtually every possible crushing situation.

## Sales district created for P & H

PETER F. KOCH has been named manager of a newly created Jackson, Miss., district office to handle P & H construction and mining equipment manufactured by Harnischfeger Corp., Milwaukee, Wisc.

## Torpey sales mgr. for Joy

HERBERT G. TORPEY has been appointed district sales manager for Joy Mfg. Co.'s Mining and Construction Div. San Francisco office. He replaces L. C. Rhodes. Mr. Torpey will manage sales and service of the company's line of equipment for metal and hard-rock mining and heavy construction industries. He began his career with Joy in 1951.

## Judson Bemis elected president

JUDSON BEMIS OF MINNEAPOLIS has been elected president and chief executive officer of the Bemis Bro. Bag Co., and F. G. Bemis of Boston was elected chairman of the board. Judson Bemis succeeds his brother F. G. Bemis, who joined the company in 1926 and just completed his 20th year as its president. As chairman of the board, F. G. Bemis will be in the company's general offices in Boston.

## Meissner opens office in Alaska

MEISSNER ENGINEERS, INC., of Chicago have opened a branch office at Juneau, Alaska, to handle present and potential consulting engineering work —both civil and industrial. In addition to headquarters office in Chicago, there are branches in Reno, Nev., Charleston, W. Va., Montgomery, Ala., and Phoenix, Ariz.

Present work in Alaska includes design of 60 miles of primary highway from Eureka to Tanana.

## Groundbreaking ceremony

AS A HUNDRED representatives of industry, press and the business community looked on, a giant bulldozer broke the first ground for a new multi-million-dollar engine plant at Harvey, Ill. The 515,000 sq. ft. of space will enable Allis-Chalmers Mfg. Co. to build a broader line of diesel, gas and gasoline engines.

Architect and general contractor for this, the third manufacturing plant in the Harvey area, is H. K. Ferguson Co. of Cleveland. Completion is now scheduled for July, 1961.

## St. Regis appoints Todd

ST. REGIS PAPER CO. announces the appointment of John Todd as sales service manager in the Los Angeles, Calif., district of its bag division. Mr. Todd succeeds G. E. Dickinson, who has been transferred to the St. Regis Kraft Div. at Tacoma, Wash.

*(Continued on page 162)*

# SPEAKING of OPERATIONS

## THE TOOLS FOR YOURS ARE IN THE **BOOK**

## *Ready Mixed Concrete*

**By**

**James A. Nicholson**

Now get the *inside story* on the fastest-growing industry in the world. READY MIXED CONCRETE contains 10 sections and 40 chapters of know-how for organizing a new business or improving an established one. James A. Nicholson, recognized authority in the field, covers every facet of successful operation . . . from maintenance to merchandising . . . from front-office management to labor and customer relations. Send today for this powerhouse of interesting, informative reading.

**ROCK PRODUCTS . 79 W. MONROE STREET . CHICAGO 3, ILL.**

**SEND TODAY!**

**$5**
A COPY

**$4 a copy in units from 4 to 20 . . . Ask about special discounts on orders of more than 20.**

**Please send_____ copies of READY MIXED CONCRETE. I enclose $_____ (check or money order).**

R-760

**Name** .....

**Company** .....

**Street** .....

**City** .....

**Zone** ..... **State** .....

*(Continued from page 160)*

## Richardson names district manager

THE APPOINTMENT of Richard Gruber as its New England district manager has been announced by Richardson Scale Co. Prior to his new appointment, Mr. Gruber was a sales engineer with headquarters in the Cleveland area. Address of the New England District office is P. O. Box 355 (14 Bunker Hill Parkway), West Boylston, Mass.

## Brooks Industrial appointed distributor

BROOKS INDUSTRIAL SALES, INC., Sun Prairie, Wisc., has been appointed as a distributor for the complete line of construction machinery manufactured by the South Bend Div. of Curtiss-Wright Corp. In making the appointment, H. S. Stefan, general sales manager, said that Brooks Industrial Sales' territory will include all of Wisconsin. The company has been serving this area as a distributor of construction machinery for the past 10 years. Brooks Industrial will provide complete modern sales, parts, shop and field facilities for Curtiss-Wright's entire line of construction machinery.

## Cook Bros. sells truck chassis

THE WHITE MOTOR CO., Cleveland, Ohio, has purchased the designs, tooling and inventory for the half-cab ready mix and dump truck chassis developed and marketed on the West Coast by Cook Bros. of Los Angeles. White will manufacture the half-cab chassis at its Lansing, Mich., plant and will distribute them nationally. Cook Bros. will continue to merchandise the half-cabs in its present territories. Design characteristics of the chassis which produce these advantages for specialized dump body operations are an aluminum cab; a set-back front axle which can take up to 14.00 x 20 tires and up to 18,000 lb. capacity; aluminum chassis cross-members and a turning radius 3 to 5 ft. shorter than conventional-type trucks.

## Cravens is new Euclid D. R.

J. W. BLOOMQUIST, Euclid sales manager, has announced the appointment of John A. Cravens as district representative in the central sales region to succeed Olin A. Lee who has been named manager of Euclid's iron range branch in Hibbing, Minn. Craven's territory will comprise the states of Wyoming, Colorado, New Mexico and Arizona. For the past 3½ years he has been in the sales development department of Euclid at Cleveland, here he was senior field engineer on scrapers.

## Two to supervise "N-IV" activities

SPENCER CHEMICAL CO., Kansas City, Mo., has named Wm. B. Macomber and Charles M. Cooley to supervise sales and technical service activities for its "N-IV" Ammonium Nitrate. Mr. Macomber will occupy the post of sales supervisor, Industrial Ammonium Nitrate, and Mr. Cooley will be manager of technical service. Mr. Cooley joined Spencer in 1955 to devote full time to this work, while Mr. Macomber was employed in 1956.

## Lincoln Electric incentive pay averages $4,700

A PRODUCTIVITY LEVEL correspondingly higher than that of the average manufacturing company permitted The Lincoln Electric Co., Cleveland, Ohio, to pay its 1,371 employes an average of more than $4,700 in incentive pay in 1959, the firm reports. Regular earnings and other benefits are standard for the industry, Lincoln notes.

The total of about $6½ million was distributed among the employes through a merit rating of performance. This year the firm also purchased a million dollars in retirement annuities covering each employe. This marked the 26th year that Lincoln has distributed incentive pay.

## Three appointed to A-C sales offices

NEW APPOINTEES to Allis-Chalmers Industries Group sales offices are Kenneth A. Briggs, Milwaukee, and James J. Dolan, Jr., Columbus. Both recently completed Allis-Chalmers training course for graduate engineers. Eugene J. Thompson, formerly a sales representative in the Washington, D.C., office, has been transferred to the Tampa district office with the same duties. He joined Allis-Chalmers in 1956.

## American Cyanamid closes plant

DR. WM. H. BOWMAN, general manager of the American Cyanamid Co., has announced that the company will close its industrial explosives manufacturing plant in Grafton, Ill. The plant and its 890-acre site will be offered for sale. "Further operation of the Grafton plant is not economically justifiable", Dr. Bowman stated, "in view of the technological changes occurring in the explosives market and the new money which Cyanamid would have to invest to modernize the facility."

## Smiley named manager

W. T. "TEX" SMILEY has been named national service manager for General Electric mobile radio at the company's Communication Products Dept. factory headquarters. Mr. Smiley will coordinate the General Electric "authorized service station" program under which approximately 900 service shops provide technical assistance to G-E two-way radio customers across the nation.

## Personnel changes at Firth Sterling

FIRTH STERLING INC., has announced personnel changes in the sales and sales promotion departments. Thomas E. Pickering, formerly manager, advertising and sales promotion, has been appointed manager, commodity steel sales. In his new capacity Mr. Pickering will be responsible for national sales and distribution of the company's line of tool bits, drill rods and ground flat stock.

J. Martin Stokes has been named manager of the newly created sales promotion department. He was for-

merly manager, sales administration.

James J. Jordan has been named advertising and sales promotion assistant. Mr. Jordan was formerly advertising assistant with Joy Mfg. Co.

## Consolidation for Westinghouse Air Brake

THE WESTINGHOUSE Air Brake Co. announced that its Le Roi Div. operations in West Allis, Wis., Greenwich, Ohio, and certain functions of its Cleveland, Ohio, plant were consolidated into one operating unit which has been established at Sidney, Ohio. The new consolidated unit began operations in the early spring of this year.

Frank Zielsdorf, general manager of the Le Roi Div., said that studies disclosed that those separate, multiple operations had many costly manufacturing and supporting administrative functions which were duplicated in each operation. Furthermore, each facility was, for different reasons, unsuitable for maximum efficiency and economical operation. Mr. Zielsdorf said the studies revealed that the only way the needed efficiencies and economies could be realized was by combining.

## Koehring appoints two

PAUL A. MCDONALD has been made district manager for the states of California, Nevada, Utah and Arizona by the Koehring Div., Milwaukee, Wisc. McDonald has many years of experience in engineering, construction and application work.

T. W. O'Donnell has been appointed district representative for the northeastern United States by the Parsons Co., Newton, Iowa. Mr. O'Donnell's territory takes in the New England states, New York, New Jersey, Virginia, West Virginia, North and South Carolina and Michigan.

## Archer made R & D manager

WILLIAM E. ARCHER has been promoted to the position of manager of research and development for the Western Precipitation Div. of Joy Mfg. Co. in Los Angeles. The announcement was made by A. W. Knight, president and general manager of the division.

Archer joined Western Precipitation in 1950 as a service engineer in the N.Y. office, later moving to the home office in Los Angeles. He most recently was chief development engineer for the division, directing among other things the gas flow and design studies of electrostatic precipitators and experimental work on new types of Multiclone mechanical dust collectors.

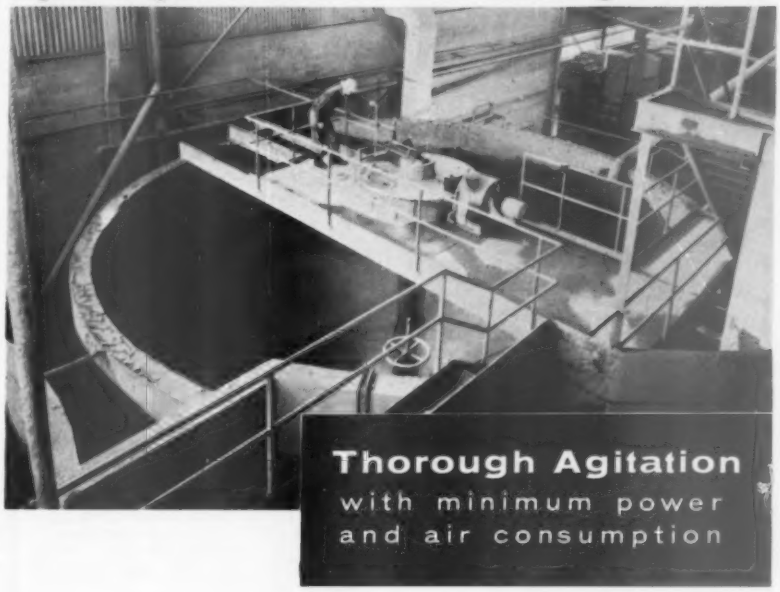
## Joy promotes Lee and Kelley

JOY MFG. CO., Pittsburgh, Pa., has named Arnott J. Lee manager of portable compressor products. Mayo C. Kelley had been appointed to fill the post vacated by Mr. Lee, district sales manager for Joy's Mining and Construction Div., Chicago-St. Louis territory. Mr. Lee will be located at the company's Michigan City, Ind., plant where he will be responsible for product planning and merchandising of the company's line of portable air compressors. Mr. Lee was manager of Joy's Washington, D.C., office.

Mr. Kelley's new responsibilities will include sales and service of Joy rock drilling and air equipment for construction and mining industries and construction equipment distributor liaison. He was manager of the company's Pittsburg district office.

END


# Specify MANITOWOC Agitators




Look at the Manitowoc Agitator above, installed in a clay slurry tank 30 ft. in diameter and 25 ft. high. This is but one of dozens of Manitowoc Agitators found in the foremost cement producing plants, both in this country and overseas. These quality conscious operators depend on Manitowoc for complete, uniform and economical slurry agitation . . . *plus* design which permits the installation of agitators in tanks up to 100 ft. in diameter, or larger.

By combining mechanical and air agitation, Manitowoc Agitators maintain consistently uniform particle size and chemical analysis in any type of slurry *without* a continuous application of air. As a result, compressed air consumption and operating costs are substantially reduced. Combine this cost-saving feature with the exclusive Manitowoc Control Valve, scientific air pipe design with an improved check valve, and rugged, channel construction agitator arms and you have the finest slurry agitator for turning out highest quality cement at *your* plant. Write now for detailed, helpful information.

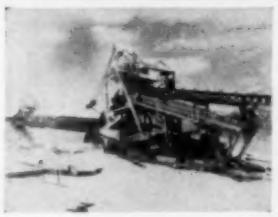
**Manitowoc Shipbuilding, Inc.**
MANITOWOC, WISCONSIN
A subsidiary of The Manitowoc Company, Inc.

*Enter 1459 on Reader Card*

# WHERE TO BUY

You may find just what you're looking for in the used equipment, employment and professional advertisements below. Box numbers are confidential and advertisers' names will not be disclosed. Send replies to: Box Number (shown on ad), c/o ROCK PRODUCTS, 79 W. Monroe St., Chicago 3, Ill. All replies will be forwarded to advertisers daily.

## ROCK-BOTTOM PRICES ON TOP QUALITY EQUIPMENT



Conveyco Mobile Stacker

**CONVEYORS**
3—6" x 43' Carpco, BC-68, sliding belt.
2—6" x 33' Carpco, BC-68, sliding belt.
1—60" x 150', steel framework, 100 HP. gearmotor
1—42" x 1250', Link Belt, 2—100 HP. gearmotors
1—36" x 645' Link Belt, 100 HP. gearmotor
1—42" x 870' Link Belt Trailing Type and Conveyco mobile stacker, 100 HP. gearmotor 440 V.

**CRUSHER, JAW**
1—10 x 20 Rogers Iron Works, with drive
1—10x21 Telsmith with motor & drive
1—10 x 30 Pacific, Type KH, motor & drive
1—2½" x 4" Braun chipmunk, 2 HP. 220/440 V
2—2¼" x 3 Braun chipmunk, ¾ HP. Motor
1—15" x 36" Universal, 50 HP. 220/440 V.

**CRUSHER, GYRATORY & CONE**
1—2'4" Traylor TY, Less Motor
1—4' Symons, Shorthead, 150 HP. motor
2—5½' Symons, standard, 200 HP. motor

**CRUSHING PLANTS**
1—10" x 36" Pioneer Model 40 V, UD 24 Diesel Power.
1—15" x 24" Cedar Rapids Portable, Case Gas Power
1—10" x 16" Cedar Rapids Pitmaster, Complete UD 14 Diesel

**DRYER**
1—36" x 13' Hardinge Ruggles Cole Complete excellent. Located Clearwater, South Carolina

**FEEDERS**
1—36" x 8'4" Link Belt, Apron, 3 HP. motor
1—20" x 6' Schaffer Poidometer Constant weight
1—36" x 72" Jeffrey Traylor Grizzly Feeder, 440 V.

**HOPPER**
Conveyco truck dump station, Hopper 15' x 15' x 10' with tilting Grizzly, 4' x 8' plate feeder, all complete with Hydraulic cylinders, gearmotor drives.

**KILN**
1—48" x 30' Hardinge Ruggles Cole, Complete Excellent. Located Clearwater, South Carolina

**MILLS, BALL & ROD**
1—3' x 8' Hendy Rod Mill, 30 HP. 440 V.
1—5' x 10' Marcy Ball Mill, 100 HP. 440 V.
5—8' x 9' Traylor Ball Mills

**SEPARATORS**
1—Type D-1A Exolon, 3 unit Vertical Roll Type
6—Type MI-418 Carpco High intensity
2—Type HT-460 Carpco, High Tension

**SCREEN**
1—9' dia. x 54½' Yuba Trommel, 100 HP. West. 440 V.
3—4' x 12' Tyler Ty-Rock, F-600, 10 HP. 220/440 V.
1—4' x 8' Symons Rod Deck Screen, 7½ HP. 220/440 V.
1—4' x 10' Tyler Hummer, Type 38
2—6' x 12' Allis Chalmers lowhead, 10 HP. 220/440 V.
1—4' x 14' Cedar Rapids 3 deck 20 HP.

**SHOVELS**
1—Model 111 M Marion shovel & Dragline, Diesel Electric 4 yd., 100' Dragline Boom
1—Model 170 B Bucyrus Erie Electric shovel Essco Bucket, 2400/4160 Y, Rotoclone Air Filter system, Complete with rubber cable, and Junction Box.
1—Model 7200 Marion walking dragline, diesel-electric

**WHEELS, DEWATERING**
4—12'—6" x 4' Conveyco Sand Wheels, Complete with Tank, w/20 HP. West. gearmotors, Exc.

**GET OUR LIST of EQUIPMENT**

**AMERICA'S LARGEST MINING EQUIPMENT LIQUIDATORS**

## MACHINERY CENTER INC.

**1201 South 6th West PO Box 964 HU 4-7601 Salt Lake City 10, Utah**

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**SPECIALS!!!**
Buffalo type B 60 ton motor truck scales 45' x 12' platform, tape recorder and printer
Fuller-Kenyon Conveying system pump type H2-7
Fuller Kenyon Airslide cement conveying system
Truck scales 20 ton, 20'x8' American Pitless
Norblo Automatic bag type dust arrester.
No. 10 Norlbo Type HELM collectors
Howe scale No. 82 exact weight indicator
St. Regis Type 100 LS valve bag filling machine.

**MILLS—CRUSHERS—KILNS—DRYERS**
**JAW:** Reliance, 14x24, Buchanan 18x36, 36x42, Type C 30x42, Cedar Rapids 2036, Traylor 28x36, 36x48, 54x72, Lippman 24x36; Universal 30x42; Superior McCully 42x40.
**GYRATORY:** Al. Chal. 9, 5K, 10", 16, Gates 12K; Traylor TZ Kennedy Van Saun 37½.
**CONE:** Symons 3', 4¼', 5½', Kue-Ken 36"; Traylor TY4; Telsmith 3'.
**ROLL:** Cedar Rapids 24x16, 55x30; Al. Chal. 27x16, 42x16, Pioneer 40x22, 40x24 triple, 54x24; Telsmith 40x22; Universal 30x18; Lippman 40x20.
**MILLS—ROD**—Denver 4x8, 4x10; Hardinge 4x10; Marcy 3x8, 8x12.
**TUBE:** Al. Chal. 6x22, Smidth 5½x20, 6'6"x21; Hardinge 4½x16" 8x18"; 8x9'; 8x36; 8x48; 10x48.
**HAMMERMILLS:** Penn 8XT-350 HP motor, 6XR 10'x4'7". Stedman 24x30, 36x42; Cedar Rapids 50-50, 2032, 30x33, 30x42 double; Dixie 36x50.
**AUTOCLAVES:** J&C 6'8"x58" Quick Acting.
**KILNS:** 6'x50', 6'x120', 9'x100', 8x124'.
**DRYERS:** 6'x40, 6x60, 6x72.
**BALL MILLS:** 4½'x16", 8'x36", 8'x48"

**CRUSHING—WASHING—CLASSIFIER**
Pioneer 10"x16" Crush. Plant with Pioneer 305-W Washing-Screening Plant
Eagle log washers Model BMD 48"x30'; BMD 4322 7'x21' Twin, 36"x20' dbl. log washer, 36"x30' Pioneer Port. 10x24 jaw, 24x18 roll. Complete C-R Prim. Port 22x36. Diesel.
Diamond Wes-Con Port. Prim. 20x36" crusher.

**CONCRETE PLANTS AND EQUIPMENT**
Johnson 150 ton 3 compt. aggr. cement silo, 1500 bbls. Complete.
Johnson 400 yd 6 compt. aggr. large capacity.
Johnson automatic batch, 10,000 bbl. cement
Noble CA 254, 4 compt. large capacity. Complete
Noble CA 154, 150 tons 4 compts. aggregate cement silo 2000 yds.
Noble CA-104 100 4 compt. 900 CF cement silo
Noble 5000 bbl. cement storage, elevators, 250 bbls. per hr.
Butler 2000 bbl. cement silo, elevators, etc.
Cook Bros. Model BD8I bulk cement semi-trailers
Erie Strayer 120 tons aggr. bin, 880 bbls. cement
Erie Strayer, new 1955, 40 yds per hour.
Blaw-Knox 400 bbls HI and 400 bbls LO cement bins and aggregate 3 compart. bin. Complete
Smith 84-S 3 yd Tilt. Mixer 40 HP AC motor

**SUCTION DREDGES FOR SAND-GRAVEL**
Morris 6" Diesel on 14'x36' hull
Ellicott 14" x 12" Steel Hull 64' x 32' Diesel.
10" Portable Diesel powered. Complete.
Amsco 12" suc. 10" Dis. Hull 24'x50' Diesel-Elec.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6"
8" Hydraulic Diesel. On 32'x8' steel pontoons
6" portable Diesel complete with cutters, etc.

**SCREENS**
Tyler-Hummer 4'x10' 2 Deck
New Symons 3'x12' 5 HP Elec. Motor.
Pioneer 5'x12' 3 deck spring suspension
Cedar Rapids 4'x12' dbl. deck 25 H.P. elec. motor
Pioneer 5'x12' 2 deck 20 HP elec. motor
C-R 4'x14' 2 deck 25 HP motor

## RICHARD P. WALSH CO.

30 Church St. CO 7-0723 — New York 7, N. Y. Cable: RICHWALSH

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## FOR SALE

1—10' x 48" Hardinge mill.
1—8' x 36" Hardinge mill.
2—16' Sturtevant air separators.
1—6' x 50' dryer.
1—#1 Raymond mill.
1—3 to 4 T.P.H. continuous type lime hydrator.

**W. P. Heineken Inc.**

Engrs. & Mfgrs. 50 Broad St., N.Y.

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## BEST BELT BUYS

**Heavy duty, 2500-3000# cover tensile, 16-19# friction pull. Brand new.**

| 4 ply 28 oz. | | List | Sell |
|---|---|---|---|
| 14" | ½"x1" | $4.48 | $2.60 |
| 16" | ⅛"x⅛" | $5.06 | $2.93 |
| 18" | ⅛"x⅛" | $5.61 | $3.26 |
| 18" | ⅛"x⅛" | $5.92 | $3.44 |
| 20" | ⅛"x⅛" | $6.14 | $3.56 |
| 24" | ⅛"x⅛" | $7.22 | $4.18 |
| 24" (5 ply) | ⅛"x⅛" | $8.78 | $5.09 |
| 30" (5 ply) | ⅛"x⅛" | $11.30 | $6.50 |

Many other sizes. Samples on request. For delivery from New York or midwest warehouse, call collect:

**PALTECH CO.**
New Canaan, Conn. WO 6-4126
*Sales agent inquiries invited.*

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## EIGHMY EQUIPMENT COMPANY

Haiss 75W Bucket Loader, wheel type, LeRoi gas, A perfect machine.

I-H TD14 2 Yd. Hydraulic Hough Loader, new rails, engine excellent. CLEAN.

LBS LS85 ¾ Yd. Dragline, I-H diesel, in very good shape.

LaPlant-Choate C114 Scraper, 14 Yd. tires like new—condition excellent.

**EIGHMY EQUIPMENT COMPANY**
Pierpont at W. State St. WO 4-6706
ROCKFORD, ILLINOIS

# BONDED QUALITY BARGAINS

**CURRENT MODELS - IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE FOR FREE CATALOG AND PRICES**

## BONDED TROUGHING IDLER CONVEYOR BARGAINS

8" Jr. I Beam Frame Conveyors

Truss Frame Conveyors

**Built Like A Bridge For High Tonnages Clear Spans to 50 Ft.— Any Length—Any Belt Width**

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2 1/16" or 2 7/16" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

### JR. I BEAM CONVEYOR PRICES

**Conveyor Prices Include Belting**

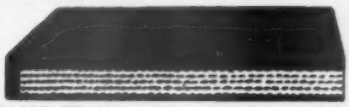
| Belt Width | Conveyor Length | List Price | Sale Price | Add or Deduct Per Foot |
|---|---|---|---|---|
| 14" | 25' | $1425 | $ 766 | |
| 14" | 50' | 2266 | 1181 | $16.62 |
| 14" | 85' | 3445 | 1763 | |
| 16" | 20' | 1287 | 700 | |
| 16" | 45' | 2180 | 1128 | |
| 16" | 60' | 2715 | 1384 | 17.10 |
| 16" | 90' | 3786 | 1897 | |
| 16" | 150' | 5928 | 2923 | |
| 18" | 25' | 1507 | 830 | |
| 18" | 45' | 2261 | 1190 | |
| 18" | 70' | 3205 | 1641 | |
| 18" | 85' | 3771 | 1912 | 18.03 |
| 18" | 100' | 4337 | 2182 | |
| 18" | 130' | 5469 | 2723 | |
| 18" | 200' | 8111 | 3985 | |
| 20" | 25' | 1547 | 871 | |
| 20" | 60' | 2940 | 1546 | |
| 20" | 75' | 3536 | 1836 | 19.30 |
| 20" | 90' | 4133 | 2125 | |
| 24" | 25' | 1622 | 922 | |
| 24" | 45' | 2479 | 1335 | |
| 24" | 70' | 3550 | 1852 | |
| 24" | 100' | 4835 | 2473 | 20.68 |
| 24" | 120' | 5692 | 2886 | |
| 24" | 150' | 6977 | 3507 | |
| 24" | 200' | 9119 | 4540 | |
| 30" | 50' | 2969 | 1591 | |
| 30" | 70' | 3948 | 2054 | |
| 30" | 90' | 4928 | 2518 | 23.17 |
| 30" | 140' | 7376 | 3676 | |
| 36" | 25' | 1854 | 1105 | |
| 36" | 45' | 2915 | 1623 | |
| 36" | 60' | 3711 | 2012 | 25.91 |
| 36" | 100' | 5832 | 3048 | |

Other lengths and belt widths priced upon application. **BONDED 36" DEEP TRUSS CONVEYORS** also built in heavy duty Portable Models. Available with Screen and Feeder and with mast or mastless type undercarriage and hydraulic powered mechanism. Lengths to 60 feet and belt widths through 30 inches. Equipped with Tow Hitch for easy moving from one job-site to another.

**PRICED FROM $2365.**

## TESTED CONVEYOR BELTING*

**WE PAY FREIGHT ON 200 POUNDS OR OVER PLUS AN ADDITIONAL 10% SAVINGS FROM SALE PRICE FOR FULL ROLLS 500 TO 650 FEET.**



**MAJOR BRAND:** 12# to 15# Friction Pull. 800# to 1000# Cover Tensile. Heavy Duty. 28 oz. duck. 1/8" top x 1/32" bottom rubber covers. Tough cotton duck, strong carcass and proper flexibility. Used in moving boxes, bags, coal, sand, gravel, crushed stone, salt, earth and similar materials.

| Width | Ply | Domestic Belt Per Foot |
|---|---|---|
| 14" | 4 | $2.94 |
| 16" | 4 | 3.09 |
| 18" | 4 | 3.42 |
| 20" | 4 | 3.95 |
| 24" | 4 | 4.43 |
| 30" | 4 | 5.42 |
| 36" | 4 | 6.43 |

**MAJOR C-BEE BRAND:** Smooth Surface. 15# to 17# Friction Pull. 1600# to 2400# Cover Tensile. 28 oz. duck 4 Ply, Skim coat between plies. Heavy Duty belt for severe service and abrasion resistance.

| Width | Top Cover | Bottom Cover | Imported Belt Per Foot |
|---|---|---|---|
| 14" | 1/8" | 1/32" | $2.96 |
| 16" | 1/8" | 1/32" | 3.12 |
| 18" | 1/8" | 1/32" | 3.44 |
| 20" | 1/8" | 1/32" | 3.97 |
| 24" | 1/8" | 1/32" | 4.46 |
| 30" | 1/8" | 1/32" | 5.56 |
| 36" | 1/8" | 1/32" | 6.45 |

**THE FOLLOWING BELTS ARE 5 PLY, 32 OZ. DUCK:**

| | | | |
|---|---|---|---|
| 24" | 1/8" | 1/16" | $5.33 |
| 30" | 1/8" | 1/16" | 6.59 |
| 36" | 1/8" | 1/16" | 8.45 |

**MAJOR BEE BRAND:** 16# to 19# Friction Pull. 2400# to 3000# Cover Tensile. Skim Coat Between Plies. A high grade of heavy duty, 28 oz. duck with 1/8" top x 1/32" bottom rubber covers. For severe service and abrasion resistance. For stone, mineral ores, concrete, cement and coal.

| Width | Ply | Domestic Belt Per Foot | Imported Belt Per Foot |
|---|---|---|---|
| 14" | 4 | $3.18 | $2.98 |
| 16" | 4 | 3.60 | 3.14 |
| 18" | 4 | 3.98 | 3.47 |
| 20" | 4 | 4.54 | 3.99 |
| 24" | 4 | 5.14 | 4.50 |
| 30" | 4 | 6.31 | 5.58 |
| 36" | 4 | 7.64 | 6.50 |
| 24" | 5 | 6.01 | 5.25 |

**MAJOR B-X SMOOTH SURFACE:** 20# to 24# Friction Pull. 3400# to 4000# Cover Tensile. A heavier duty belt with 1/8" top x 1/32" bottom covers. For higher abrasion resistance and handling of materials where more strength is required.

| Width | Ply | Domestic Belt Per Foot | Imported Belt Per Foot |
|---|---|---|---|
| 16" | 4 | $3.93 | $3.31 |
| 18" | 4 | 4.37 | 3.64 |
| 20" | 4 | 4.98 | 4.02 |
| 24" | 4 | 5.63 | 4.71 |
| 30" | 4 | 6.92 | 5.80 |
| 36" | 4 | 8.16 | 6.84 |

*** All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.**

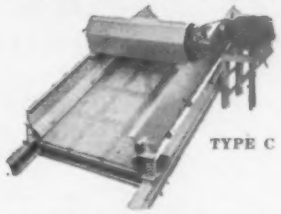
Other widths, plies, duck weights and cover thickness available at low prices.

**WRITE FOR FREE SAMPLE & BULL. #1263**

## BONDED* VIBRATING SCREENS

**PROMPT SHIPMENT OF ALL MODELS**

### SPECIAL SERVICE SCREENS



TYPE C

**WRITE FOR BULLETIN #1224**

For scalping middle-range pieces and accurate sizing of fines where quantity and feed do not warrant a larger capacity, heavy duty model. Medium to heavy construction. Can also be suspended from four steel cables and springs for portable or temporary installation. Vibration remains in working screen body. No shaking of tipple, building or platform.

**Priced from** .....$487

**WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULL. 1224**

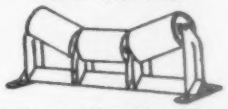
### HEAVY DUTY SCREENS

**FACTORY BALANCED, CONTROLLED VIBRATION.** Four bearing positive throw eccentric shaft; 3' x 6' to 5' x 14'. 1 to 5 decks. **"9 REASONS WHY BONDED IS YOUR BEST BUY."**

For high tonnages, heavy scalping and multiple sizing of such minerals and industrial products as handled by above models. No dead spots. Springless live-rubber mounting of screen body controls vibration. Screen cloth and plate in all models reversible for longer life. Their finished edges prevent plates from splitting and cloth from ravelling.

**Priced from** .....$1620

## BONDED® IDLERS & RETURN ROLLS FOR UTMOST ECONOMY ON THE JOB



3-roll, 5" diameter Troughing Idlers for:

| | | | |
|---|---|---|---|
| 14" belt | $19.75 | 24" belt | $22.75 |
| 16" belt | 20.50 | 30" belt | 23.85 |
| 18" belt | 21.90 | 36" belt | 24.90 |
| 20" belt | 22.10 | 48" belt | 27.50 |

1-roll, 5" diameter Return Rolls for:

| | | | |
|---|---|---|---|
| 14" belt | $ 8.50 | 24" belt | $11.00 |
| 16" belt | 9.00 | 30" belt | 12.50 |
| 18" belt | 9.50 | 36" belt | 13.75 |
| 20" belt | 10.00 | 48" belt | 16.50 |

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

# BONDED SCALE AND MACHINE COMPANY

**PHONE Days: Hickory 4-2186** — **WRITE FOR FREE CATALOG AND PRICES** — **PHONE Evenings: AX. 1-2213 or TEmple 7-4519**

**128 Bellevue** — **Mfrs. of Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers, Feeders and Bucket Elevators** — **COLUMBUS 7, OHIO**

## STILL LIQUIDATING

**CRUSHING & GRINDING PLANT**
**MANCHESTER, CONN.**

Symons 3' shorthead cone crusher
Buchanan 13" x 24" JAW, 50 HP
Hardinge 7' x 36" conical pebble mills, silex stone lined
Allis-Chalmers 6' x 18' pebble mill, buhrstone lined.
Abbe Ang. #1B 6' x 8' pebble mills, buhrstone lined, 30 HP
Christie 4'6" x 45' rot. dryer.
Steel bucket elev.; to 40' high

**SEND FOR CIRCULAR #360A**

### KILNS—DRYERS

11' x 10' x 175' Vulcan Kiln, $\frac{13}{16}$"
11' x 155' Traylor Kiln, ¾" welded
10' x 78' National Iron Dryers, ¾" shell, center tube
8'8" x 70' Hardinge #XA18 dryers, ⅜"
8' x 114' United Kiln, ⅜"
8' x 40' Stearns-Roger dryers, ⅜"
7'6" x 62' dryer or kiln, ½"
7' x 50' Allis-Chalmers dryer, ⅜"
6' x 7' x 100' Kiln, ½" shell
3' x 23' Standard dryer, ¼"

### BALL, ROD & PEBBLE MILLS

Kennedy 7' x 9' ball, 150 HP
Hardinge 10' x 48" conical ball
Hardinge 7' x 36" conical peb.
Hardinge 4'6" x 16" conical ball
Allis 6' x 18' pebble-tube
Allis 5' x 22' ball-tube, 150 HP
Allis 6' x 16' ball-tube
Allis 5' x 5' ball, 75 HP

### CRUSHERS—PULVERIZERS

Symons 3' shorthead cone crusher
Farrel 36" x 15" jaw
Farrel 20" x 6" jaw
Buchanan 13" x 24" jaw
Mitchell 18" x 9" jaw
Penna. #5060 hammermill, 400 HP, 47" x 60", UNUSED
DIXIE #5060 hammermill, 500 HP
B. & W. #E32 pulv., 75 HP
Robinson 36" saw tooth crusher

**PERRY EQUIPMENT CORPORATION**
1418 N. Sixth St. Phila. 22, Pa.
POplar 3-3505

## MOTORS AND GENERATORS

All sizes, new and rebuilt. Starters, accessories, pulleys and repair parts. Gear motors, Falk Shaft mounted Speed Reducers, couplings and V-belt drives.
EXPERT REPAIR SERVICE
NUSSBAUM ELECTRIC COMPANY
220 E. Douglas Ave., Fort Wayne, Ind.

# LIQUIDATING

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1—Louisville rotary steam tube dryer, 8' x 45'

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1—Rotary 6' x 64', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 56', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 50', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 35', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 4' x 20', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

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2400 Lima Elec. Drag, 130', 6 yd.
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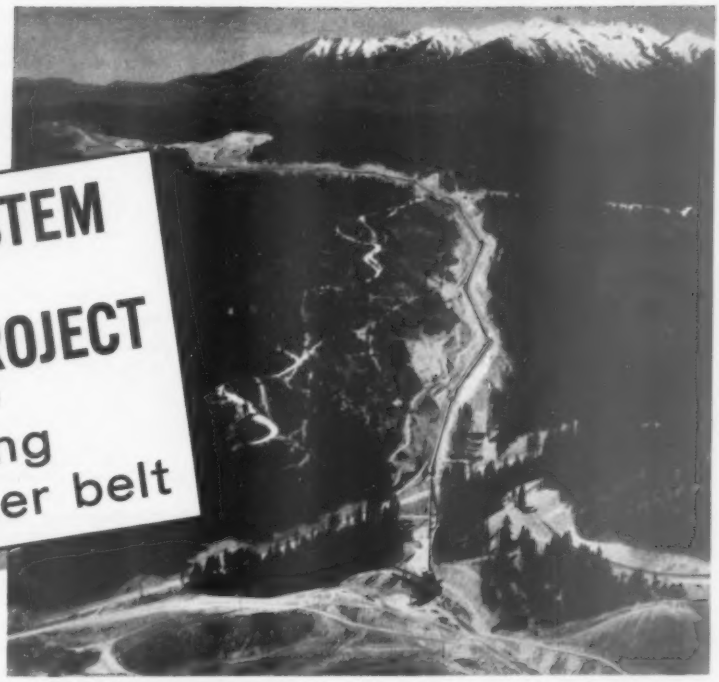
## CONVEYOR SYSTEM from TRINITY DAM PROJECT (CALIFORNIA)

2 miles long
42" wide rubber belt



**9 FLIGHTS—AVAILABLE INDIVIDUALLY.** Flights range from 672 ft. long to 1885 ft. long. Conveyor moves approximately 1700 cu.yds. per hour of impervious fill material (weathered andesite) on 850 ft. drop at 720 feet per minute from borrow pit to earth fill dam. Five flights descend a 25% grade. Much of braking effort is from electric motors acting as generators under full belt load. Also mechanically operated brakes bigger than those of a power shovel. Conveyor has operated reliably on this three year job. Complete system includes the following:

### LOADING STATION

Two drive-over hoppers with slotted tire track troughs for scraper discharge from borrow area.

### SCREEN AND CRUSHING STATION

Charged by 48" belt. Feeds main belt and acts as upper end control station. Impactor type crushers with rolls on eccentrics reduce oversize to about 6"

### NINE CONVEYOR FLIGHTS

Individual flight data provided on request. Motor sizes range from 30 hp to 300 hp. Total horsepower of entire conveyor is 3280 of which 2000 hp is within the regenerative system (5 flights on 25% grade) where power generated is fed back into main system. All flights but one employ gravity type takeups. Troughing idlers are 20°, 3 roll, 5" diameter spaced from 2.75 ft. to 4 ft. apart. Impact idlers are used at transfer points. Band type brakes are used on tail pulley shafts on all but one flight. In addition, thrustor brakes are mounted on the high speed shaft between gear reducer and motor on the 5 flights on the 25% grade.

### TERMINAL STATION

Three bins with total capacity of 1000 cu. yds. can load three CAT DW20's simultaneously. Scraper can pull in, load and pull out in 20 seconds. Bins are charged from a 60" wide shuttle conveyor with water added. By-pass belt can stack material on ground. At bottom of each bin is a pair of 7 ft. opening roller gates operated by large size air rams. Material falls through gap into automatic weighing hopper. Air ram operated roller gates tripped to discharge 25 cubic yard loads.

**16 mm color motion picture of conveyor available on request for private showing**

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Cedarapids 2236 Primary Jaw Crushing plant.
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*continued . . .*

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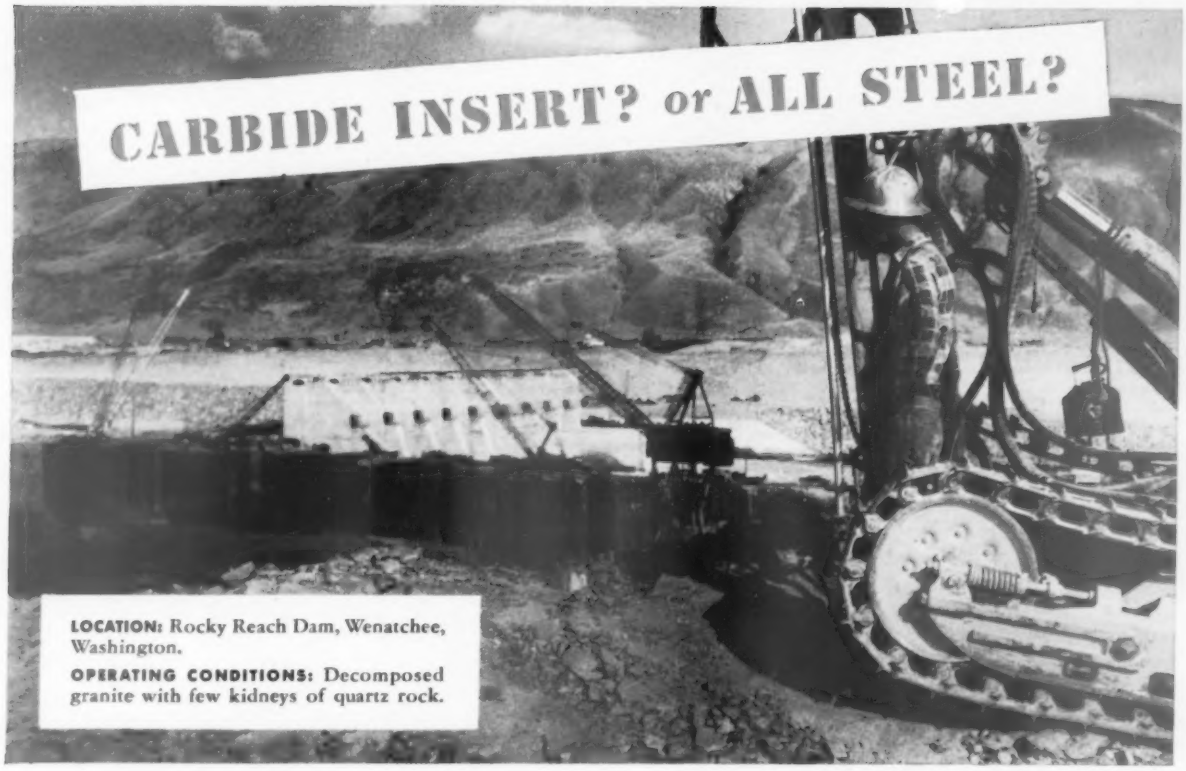
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